

THE NATIONAL
Provisioner

NOVEMBER 26, 1955

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**CONVENTION
REPORT**

PROCEEDINGS OF THE 50th
ANNUAL MEETING
OF THE
AMERICAN MEAT INSTITUTE

50



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News and Views

THE NATIONAL PROVISIONER

VOL. 133 No. 22

NOVEMBER 26, 1955

1906 Fear - 1955 Faith

Comparison of meeting No. 1 of the American Meat Packers Association, and meeting No. 50 of the American Meat Institute, is almost inevitable for THE NATIONAL PROVISIONER, which has lived with the meat industry and recorded its history since 1891.

The first meeting of 1906, primarily impelled by the need of individual companies to form a collective agency through which they could meet some of the problems arising out of the new federal meat inspection program, was held in an atmosphere of foreboding and suspicion. Not only were these first conventioners uneasy about the government, the press and the public's attitude, but they were also watchful and suspicious of each other. They hesitated to give up any scrap of their individualism in the interest of collective endeavor.

Essentially, the handful of packers who gathered in 1906 were bent on defense—on trying to ride out a storm and preserve themselves in the face of new-fangled and irrational ideas about how they should conduct their business. They could scarcely have guessed that by the fiftieth meeting of the association, their successors would have swallowed and digested their problems many times over, and would be firmly committed to the offensive on many fronts—all pointed toward making the industry greater and more prosperous.

There wasn't much thought of defense or maintenance of the status quo among the 6,550 industry people who met in Chicago this month; their eyes were focussed on the future: How can we trim pork to make consumers like it more? What do frozen consumer cuts mean to the meat industry? How can we use antibiotics, irradiation and other techniques to make our products better and less perishable? What can we do collectively in the field of advertising to sell more meat?

Not only is the industry moving forward rapidly—even experiencing a technical and merchandising renaissance as we pointed out some months ago—but in doing so it is utilizing all the advantages of group action as well as displaying individual initiative.

Just to keep the record straight, the convention just ended was the Institute's fiftieth, but did not mark its fiftieth year.

Institution Of Any agricultural program that would encourage additional cattle production on diverted acres was protested this week by the American National Cattlemen's Association. "Cattlemen are meeting extreme difficulties in adjusting supply to consumer demand," said Jay Taylor, American National president, in asking Secretary of Agriculture Ezra Taft Benson to discourage the raising of additional cattle in any future crop support program.

Secretary Benson had disclosed earlier that the USDA "may" include a soil bank plan in its coming recommendations to Congress. A soil bank plan is being studied by the National Agricultural Advisory Commission, which hopes to reach a firm decision by next month, the Secretary announced. He added that several soil bank proposals have been considered and rejected.

"It would be disastrous to many cattlemen, operating on land suitable only to grass, if beef surpluses are built up through a soil bank plan which would encourage additional livestock production," Taylor declared. He pointed out that the many additional cattle produced and grazed on land already diverted in current crop support programs had contributed seriously to the overburdened cattle market this year.

Action Taken by the AMI board of directors at the annual meeting to improve consumer demand for pork through increased promotion and a closer pork trim has been commended by Secretary of Agriculture Ezra Taft Benson. "The action of the American Meat Institute and its members in appropriating \$1,000,000 for pork advertising and promotion is most gratifying," Secretary Benson said. "This action, plus their announced intention to trim pork products more nearly to meet present-day consumer preferences is an effective demonstration of ways industry can aid agriculture in meeting its difficult problems."

Whether Packing plant employees must be paid for knife-sharpening time occurring before the scheduled work day is expected to be decided within two or three months by the U. S. Supreme Court. The High Court heard oral arguments November 16 in the case of Secretary of Labor v. King Packing Co. Counsel for King Packing Co. argued that knife sharpening is a "preliminary" activity and, as such, is excluded from the Fair Labor Standards Act. The government contended that knife sharpening is an "integral" part of the principal activity of the packinghouse workers involved in the wage dispute.

An Additional western hearing on the question of westbound rail meat rates is being requested by the Western States Meat Packers Association. The Interstate Commerce Commission tentatively has set a public hearing for the week of January 16 in Denver. WSMFA, which has been the chief opponent of a proposed rate reduction on meat and packinghouse products, wants a second hearing in Los Angeles or San Francisco. The ICC recently suspended the proposed change until mid-June.

Prospects Of balancing the federal budget in both the current and the next fiscal year appear good to Budget Director Rowland Hughes. The Budget Bureau estimated last August that there would be a deficit of \$1,700,000,000 for the current fiscal year, which ends next June 30, but Hughes said he hopes this can be wiped out through increased revenues and economy measures. He made his optimistic statement following a conference with President Eisenhower at Gettysburg.

At Fiftieth Meeting of



REGISTRATION was the kickoff for five activity-packed days for the record-breaking throng of meat industry representatives who attended the fiftieth meeting of the American Meat Institute, November 11 to 15, at the Palmer House, Chicago. On these two pages, and others which follow, appear photos taken in the lobby, meeting halls, exhibit room and elsewhere to fill out the convention record with pictures of those who actually make the meeting—packinghouse people, suppliers and AMI staff members.



Looks To The Future

LIKE a circus, with continuous action in three rings and overhead, the American Meat Institute convention cannot easily be summarized — you must see and hear it.

First, there are people, such as the Americans pictured on these pages and the other ones which follow. When you have 6,550 conventioners — quiet and loud, fun-loving and thought-seeking, selling and buying, scientists and slaughterers—you have business democracy working and playing, but always learning and moving forward.

In its program focussed toward the future, the Institute caught and crystallized the compelling interest of the meat industry. Tomorrow (and maybe today) we will have:

Frozen meats for consumers (page 183); meat preservation with antibiotics (page 103); more desirable pork cuts (page 153); less perishable products through radiation (page 126), and electrostatic smoking of pork cuts and sausage (page 119).

We will probably utilize in our business:

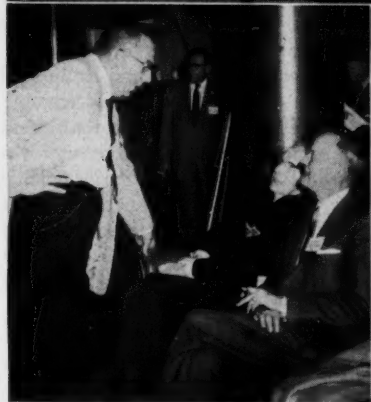
Starter cultures to give sausage a tang (page 123); specialized techniques to freeze meats (page 141); and livestock which are more quickly and economically finished with hormones and antibiotics (page 112 and page 128).

In its new and expanding world the meat industry will have to find and train executives (page 92); evaluate live hogs more carefully (page 116); systematize (page 172); automate (page 139), and stick to the ideal of quality in sausage products (page 161 and page 164).

Today and tomorrow, pennies must be saved in taxes (page 176); by control through tests (page 167); by a weekly P & L (page 171), and by using modern equipment and supplies (page 207).

In the near future livestock should move to meat plants in good volume (page 155), and economic conditions favor healthy meat demand (page 202).

CONVENTION VETERAN Joe Mellon (top photo) placidly contemplates the milling lobby where scenes like these were enacted throughout the five-day annual meeting.





The Selection, Training and Development of Tomorrow's Packinghouse Executives—Gaylord A. Freeman, jr., vice president, First National Bank of Chicago.

Preservation of Fresh Meats Through the Use of Antibiotics—Dr. Wilbur H. Miller, director of industrial applications, and Burton Bowman, sales director, fine chemicals division, American Cyanamid Co., New York City.

How to Select and Train Your Executives

• Just a month ago I sat with some of you in the Chicago Club and heard Professor Williamson of Northwestern University speak on the subject, "The Professors Discover American Business." He said that in studying business history he had learned that there are two crucial periods in the life of a business concern: first, its early days when it is just getting started, and second, the time when the founder, or the founder's family, surrenders control to successor management. This second phase often marks the decline of a business because, in many cases, the dominant aggressive founder was much more competent in building up the business, the plant, the product and sales than he was in employing and developing men of stature equal to his own.



G. FREEMAN

Many of the older packers have gone through this transition successfully, but many more are in the period of change today or soon will be. If our businesses are to continue successfully after the founder and his family have retired, it is of the greatest importance to recognize that one of our principle responsibilities is to select, train and develop our successors. Developing and improving strong managerial leadership for the years ahead is no less important than developing and improving products for our customers.

The need for trained executives is not unique to the packing business. You may have special problems. Perhaps many of the best young men look upon the packing business, despite its great security, as less exciting, less immediately rewarding, even less pleasant than many

other forms of employment. While these problems may be peculiar to the packing business, all of industry faces this problem of finding and training successor management and it finds this problem especially acute today as the result of four important facts: 1) the tremendous expansion of our business organizations in the first half of this century; 2) the failure of many concerns to hire and train adequate numbers of young men during the depression period 20 years ago; 3) the lack of adequate numbers of trainable young men during World War II, and 4) the need for more executives to handle the same volume of business, because the social and economic problems (on a national and even international scale) with which American industry has become intricately involved create enormous responsibilities for management that cannot be regarded lightly or casually dismissed.

It is apparent that American industry faces a need for more and better trained executives, but as Edward Stettinius said less than 20 years ago:

"The crux of the situation is not so much the need for men nor the scarcity of proved leaders as it is the failure of American business management generally to introduce an orderly and methodical system for the discovery, development, and assignment of executive personnel."

As recently as 1943, when the National Industrial Conference Board set out to make a study of training programs for executives it soon discovered that there were not enough such programs to form the basis for a report. The last ten years have witnessed a major change in this respect. Many of you now have such programs but for the few of you who don't and those few who would care to review their existing plans, let's review these programs. First, we might be more precise as to what the end product is that we want to produce.

Crawford Greenewalt, president of du Pont, has said: "The basic requirement of executive capacity is the ability to create a harmonious whole out of what the

academic world calls dissimilar disciplines. This is a fancy way of saying that an executive is good when he can make a smoothly functioning team out of people with the many different skills required in the operation of a modern business. His most important function is to reconcile, to coordinate and to compromise and to appraise the various viewpoints and talents under his direction to the end that each individual contributes his full measure to the business at hand. Perhaps the best analogy to an executive's job is that of the symphony conductor under whose hand 100 or so highly specialized and very different talents become a single effort of great effectiveness."

Somewhat more prosaically, the executive's duty is to assume the responsibility for effectively using the physical and human resources of the company to produce a maximum profit over the life of the company.

What kind of a man does this best?

Perhaps the most empirical method of discovering what qualities an executive needs is to analyze the characteristics of those men who already have become successful executives. Just such a study, indeed 600 pages of it, was concluded recently by Dr. Robert M. Wald. A condensed summary written by Dr. Wald and Dr. Roy A. Doty, both of George Fry & Associates, was published in last year's July-August issue of the *Harvard Business Review*. The composite description of some 33 executives, whom they analyzed in terms of intelligence, interests and personality characteristics, showed that the outstanding characteristics of the successful executive are intellectual ability, firmness, frankness, seriousness, tranquility and tolerance.

The major interests of the typical executive were persuasive and literary, and he had good health and a happy home.

This same group of executives was polled for their judgment as to the qualities most important in promoting younger executives and 85 per cent of them stressed "interest in the work of the company as a whole." The second most necessary characteristic (and one which they felt had been the most important in their own progress) was skill in human relations, that is, the ability to get along with other people, inside the company and out.

If we take these various findings, we can make out a list of what we might consider the ten most important characteristics of an executive:

1) Integrity; 2) Ability to get along with others; 3) Intellectual ability; 4) High degree of identification with the company; 5) Firmness; 6) Ambition; 7) Frankness; 8) Objectivity; 9) Health, and 10) A happy home.

If I were to add another, it would be a sense of humor so that the executive can see his problems and himself in true proportions. It is possible that your company is staffed with an adequate number of men with these characteristics to meet your present and your future requirements, but it is not probable.

Once your company is wise enough, frightened enough or well enough advised to face the problem, you probably will take three successive steps.

a) Find out where you are: Analyze your present organization and appraise the qualifications and potentiality of your present executives and your potential executive group.

b) Decide where you want to go: Establish your business goals and analyze their implications as to the number and caliber of future executive personnel, taking into consideration the needed replacements due to the elimination of poorly qualified persons, deaths, retirements and other normal attrition.

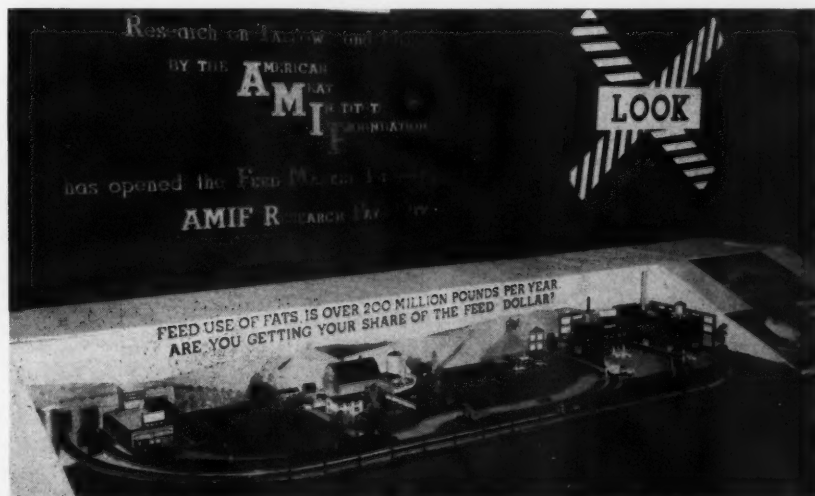
c) Adopt a procedure for developing the needed executives: Establish procedures for the selection of employees with potential and the systematic strengthening of the talents of present employees and the helping of new employees to develop as rapidly and broadly as possible, as well as some procedure for the continuous appraisal of executive and trainee performance and promotability.

We will confine our discussion to the third phase, the selection, training and development of tomorrow's packinghouse executives. The first step is to find young men with the capacity to become such leaders.

Where do you find the future executive? You probably will find him in your own company.

A recent survey of 159 business leaders disclosed that, in their entire business life, 73 per cent had worked for only three companies or less and 36 per cent had worked for only one company. While I cannot prove it statisti-

HO SCALE MODEL railroad, with its train of tallow tank cars, feed manufacturing plant, packinghouse and farm, drew young and old conventioners to one of the exhibits of the American Meat Institute Foundation. The exhibit pointed out the growing importance of use of animal fats in feeds — a market uncovered by research.



cally, I believe that the packing business probably promotes an even greater proportion of its executives from within its own ranks.

There are essentially two ways in which this future executive may have come into your organization.

The first is the "Horatio Alger" method. A young high school graduate walks in off the street, takes the bottom job in the shop or the office, works his own way up for 40 years and finally emerges as the best man available for the presidency. That has been the historic method in the banking business and, I believe, in the packing business as well.

The second method is for the company to go out and hire a young man for the particular purpose of training him to become a potential executive. If you are going to hire a young man for this purpose, you would probably pick a college graduate. While not all college graduates succeed and not all who succeed are college graduates, the survey by Drs. Wald and Doty indicated that two-thirds of the executives studied were college graduates, "a very high figure considering that only about one-fourth of 1 per cent of the total population of this country was even enrolled in college 30 years ago" when these executives were of college age.

The experience at Sears, Roebuck & Co. would bear this out, for while Sears has concluded that "college degrees, as such, do not necessarily contribute to the rate at which people move ahead" to the store manager level, "on the other hand, there is a definite trend in Sears and probably elsewhere for college men to predominate at the higher executive level."

In hiring the college graduate, from which college course should you choose?

Most of you employ a good many young men directly from technical schools or from specialized courses for you will feel that the specialist, the chemist, the agronomist, the animal husbandry man, the engineer, the market analyst or the transportation specialist is immediately more useful than the general man and at the same time has equal ability to advance rapidly through the beginner's jobs to management levels.

Indeed, this preference for the specialist over the more generally educated "liberal arts" man is very pronounced if the experience at Yale University is typical. In 1950

only 18 out of 66 corporation talent scouts who visited Yale were willing even to talk to liberal arts college graduates, in 1951 only 15 out of 91, in 1952 only 16 out of 117. At Johns Hopkins University, in 1953 only 16 out of 200 scouts had any interest in the liberal arts man as compared to the engineer, the chemist or other specialists.

While it is true that the liberal arts major is not as immediately productive, the very "generality" of his education may make him ultimately a more useful executive than the specialist whose education and mental disciplines have been confined to a narrow area. Modern business analysts in pointing out that "This functional specialization has tended to limit the points of view of potential executives and to confine them to very narrow functions," are merely stating the counterpart of Aristotle's observation in 384, B.C., that "The man who has been educated in a subject is a good judge of that subject, and the man who has received an all-around education is a good judge in general."

The executive who is to run your business cannot afford to be a mere specialist; he must be a generalist. Perhaps he can come to you as a specialist and then broaden his areas of interest, thought and activity but "It is not only difficult but impossible, except in rare instances to turn a specialist into a generalist unless the process is started far earlier in life than business in this country has hitherto contemplated," Lyndall F. Urwick has concluded. As the same writer put it, "you can't make a Hollywood star out of an elderly spinster."

As a consequence, the banks, and lately many manufacturing and merchandising companies, too, have been hiring more liberal arts graduates. Inland Steel Co., for instance, with a relatively great need for engineers and metallurgists, in the past three years has employed more liberal arts graduates than technical and business administration graduates combined.

This is not yet a common practice, but it is likely to become so for a general program in the field of liberal arts should provide the best possible formal education not for the apprentice, but for the ultimate executive. The word "liberal," as used in the phrase "liberal arts," means "free." The liberal arts are that area of knowledge designed to free men's minds and spirits from re-



PACKERS GOT A GOOD look at the "new look" in pork cuts on display at the convention. Close-ups of the new and old trim appear elsewhere in the PROVISIONER.

straint, to widen their horizons, open their imagination to create and accept new ideas, and to afford them what Professor Whitehead described as "the perpetual vision of greatness."

Clarence B. Randall, chairman of the board of Inland Steel Co., recently pointed out that: "For the perpetuation of management in corporate life we require men trained in the creative and imaginative qualities that come from a general education. We want, first of all, a man who has demonstrated that he can master any subject. And above all, we require a man who has the intellectual courage to tackle something for which he was not trained. A business leader must be able to walk with confidence on unfamiliar ground."

A general liberal arts education is the best possible preparation for such responsibilities.

Which boy should be selected?

No two jobs require precisely the same characteristics. If you are hiring a future sales manager, you may place more emphasis on the extrovert qualities than if you are picking a future auditor. But if you are picking a young man with the potentialities to develop into a future top executive for a large packinghouse, there may be certain characteristics which are measurable even at the college age. Thus, the executive analysis previously mentioned indicated that, in the group studied, the subsequent characteristics of intellectual ability and skill in human relations had, at the college age, been evidenced by:

1. A background of a happy, upper middle-class home in a city;
2. A scholastic average of "B" or better, and
3. Participation in at least one, and in most instances, several, extracurricular activities.

This is little enough as a guide but it does tend to support what both the colleges and the employment scouts have long known, that grades, extracurricular activities and "balance" are the best available indicators of future usefulness.

Who is going to do the picking?

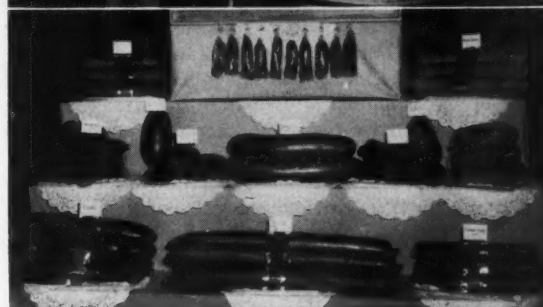
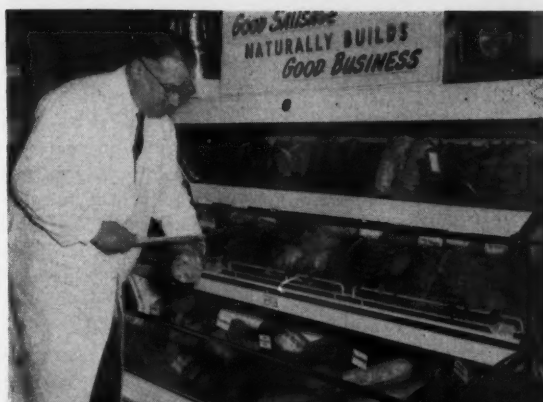
While some companies make a practice of hiring young specialists and others adopt a definite policy of preferring liberal arts men, the senior officers in most companies have never given the matter any serious thought or arrived at any definite preference. Far too often, as G. L. Bach has said, "The personnel man gets his specifications basically from the foreman . . . who has an immediate job to be filled and little feeling of responsibility for developing future management talent."

More and more companies seek to avoid this by encouraging the personnel recruiters to employ not merely immediate workers but potential future leaders.

Inland Steel Co. has a unique approach in that it sends its senior executives out to do the college recruiting, not because they are better recruiters (perhaps the contrary), but because they believe such an experience will enable the executives to become better judges of potential leaders and able to choose from the company's own talent.

What inducements can you offer?

Competition in the man power market has become very intense. In 1920, there were only a dozen companies recruiting on the college campuses. By 1940, 1,500 companies were interviewing college graduates. Today, there are more than 5,000 companies recruiting college and university graduates.



ALL KINDS OF SAUSAGE in natural casings are good to look at, good to eat and good to sell was the basic theme of the display and other activities of the AMI natural casings committee during the annual meeting.

If you seek college graduates, either specialists or liberal arts men, you may ask how you can get them to come to your company. A decent starting salary helps, but that isn't the only important inducement, perhaps not even the most important.

Stop a minute and analyze why you like the packing industry, or the particular company by which you are employed. What are the rewards in a business that satisfies a man? Does your company offer these?

A year ago when the then president of the American Bankers Association asked me to talk to a college group about the banking business, I attempted to make this type of analysis and concluded that what most of us want, although not necessarily in this order, are:

- 1) A feeling of usefulness; 2) An opportunity to get ahead; 3) Security; 4) Money; 5) Respect; 6) Pleasant working conditions; 7) Knowledge; 8) Power; 9) Challenge, and 10) Independence.

Most educated young people are considerably more

mature and more sound in their judgment than we oldsters are inclined to realize. They respond to pretty much the same inducements that we do if they are given the facts. If a true story of the rewards offered by your company does not attract able young people, then you may have to alter the facts, not merely the presentation.

What about promotion from the lower ranks?

The hiring of college graduates to go directly into executive training programs has the serious weakness of setting aside a group of "fair-haired boys" as the heirs-apparent, and by implication excluding all other employees from the opportunity to progress into the executive group. This may have a disastrous effect on employee morale. In my observation, when the employees of a company refer to it as "we," the company is vital and aggressive; when the employees refer to it as "they," it is stratified. If one group of young men is set aside as potential executives, the balance is set aside as men of limited future and the "we" attitude is likely to change to "they."

As a consequence, most companies attempt to use both methods and by promoting a reasonable proportion of men from the ranks they overcome the impression that to succeed one must have been to college and been selected as a trainee.

How can you find these men? Present top management is in the best position to know what kind of future executive it wants, but it is in the worst position to know what kind of future executive talent it has available. This has led many companies to adopt elaborate plans for the evaluation of every employee, generally by his immediate superior. The obvious fault with such programs is that the immediate supervisor, who, at say, 60 years of age, is himself a foreman in the sausage department, may not have the same criteria or judgment that the senior officers would use.

It may be possible to provide the criteria, but those are not simple for executive ability is not something that can be measured by a work sample, like typing, or by a precise aptitude test, like finger dexterity. Executive ability is not a tangible definable skill.

Furthermore, no matter what the personnel manual says, a supervisor may not use the necessary judgment. Indeed, the very qualities which make a man a good potential candidate for executive training may irritate

the lower echelon straw-boss. Thus, the eager young man who works harder than necessary, and who is more interested in the company as a whole than he is in the shipping department and gives more attention to the company's annual report than to major league batting averages, may impress his immediate boss as an obviously square peg poorly qualified for the round hole in the shipping department despite the fact that he may be ideal material for the square hole in the executive office.

Some companies seek to overcome this difficulty by reinforcing the judgment of the immediate supervisor by that of a second or third employee. Others use the "forced-choice" technique in which the one making the rating is required to choose between alternative descriptive phrases which have previously been selected by and are subsequently appraised by trained psychologists.

While there is no substitute for personal appraisal by a superior, there is a supplement, the psychological analysis. In the past I have viewed these analyses with considerable skepticism but this spring I selected five of our officers, with whom I had been intimately acquainted for as many as 20 years, and asked them to submit to the analysis of one of our leading consulting firms, George Fry & Associates. The resulting personnel evaluation report not only described each man's intellectual ability, interests and personality characteristics, but specifically pointed out: his good points, his weak points, his qualifications for his present position, and his potentiality for further development and promotion.

These analyses were unbelievably accurate. I had known these men intimately, yet some of the findings disclosed qualities which, although I immediately acknowledged as true, I had never recognized prior to the analysis.

These psychological analyses are interesting and helpful but they are far from perfect. They should never be allowed to over-ride your own evaluation if based on really long and intimate knowledge, but they are by far the most scientific and accurate measure that is available in respect of the many employees with whom you are not personally acquainted. They provide a new and useful tool which you can use to supplement your own evaluation of your people.

Let us assume that, through these several means, you discover able young men already in your plant. Do they want to become executives?

Contrary to the classic success stories, there appear to be many young men in lower echelons who, although they

UPS AND DOWNS of convention life were somewhat alleviated for those going to visit the exhibits and hospitality rooms on the Club floor by the young lady handing out attendance blanks.



have the ability to succeed, lack either the necessary formal education or the willingness to give up the security of the lower-class job for the competition and tension of an executive development opportunity.

The lack of formal education can be overcome but the candidates' unwillingness to volunteer poses a more difficult problem. Inland Steel Co. offers every young man in the company the opportunity to volunteer to take tests of his adequacy and, if he passes, to be admitted to the executive training program. Yet, despite a continuous evaluation program intended to "discover" potential talent, and sincere encouragements to those equipped to apply, in the last seven years only six young men have so volunteered, and of these only half have passed the tests and been admitted to the program. Other companies report similar experiences. Is this evidence that some stratification is beginning to enter our society? Are these young men so conscious of class or union affiliations that they are unwilling to cross the imaginary line which they think they see? Is it a case of lower supervisory echelons scuttling management's invitation or is it merely a question of money? Certainly, a young man working in the shop, even for only a few years, is likely to be earning so much more than the trainee's salary that he may feel that he cannot afford to take the reduction in pay which would result from his entering such a training program.

The fact is that not every young man wants to be president. To some the gamble and the strain of a possible chance for an executive position are not offset by rewards attractive enough to lure the young mechanics from the security, the class identity or the feeling of "belonging" which they presently enjoy. This is a problem of possible proportions far beyond executive training programs.

But, for our immediate purposes, let us assume we have hired some college graduates and discovered some bright young mechanics. What are we to do with them?

We are in a period of great enthusiasm for management training programs. In retrospect, it may appear that, like Mah Jong and Tom Thumb Golf, these have been but a temporary fad. Certainly not all programs are successful, but there is such a basic need for trained executives that more companies are adopting such plans each year.

Accurately stated, the farmer does not grow wheat, he merely plants it and cultivates it so that it may grow. Similarly, as Robert K. Stolz has pointed out, "Companies can't develop executives; executives must develop themselves . . . but companies can and do exercise considerable control over the development of executives through the business environment they establish. The elements that effectively provide the opportunities and challenges men need to develop themselves can be defined and controlled at least in a large part."

The mere phrase, "executive development program," sounds formidable. Many older businessmen may react with, "Ours is a competitive business, and we cannot afford the time and energy necessary to develop the abilities of someone who needs experience." And to this statement they will add, "Besides we do not live in the long run; we live in the short run, today and tomorrow." Even some of you younger ones may have a deep suspicion that formal programs are overemphasizing the tools,



FLORIST and his youthful assistant deliver colorful 'mums and other flowers to one of the convention tables.

techniques, and procedural aspects of development.

Yet whether or not we apply this formal title, almost all of us have some method of training. Your practice may involve an executive audit, a table of organization, job descriptions and elaborate training schedules or it may be merely an unstated practice or job rotation in order that your good young men can serve as understudies to your good older men and at the same time see several different aspects of the company's operations.

The best candidate for an executive position is not the "best trained," but rather the young man who makes the best use of all aids, both those the company provides and those he finds for himself.

The first condition precedent for a training program is "front office" support. As Hugh Phillips, director of organization planning, United States Steel Corp., recently pointed out:

"The most essential ingredient in guaranteeing adequate attention to management development is for the 'big boss,' regardless of his responsibility, to take the leadership. When he tells his lieutenants to give adequate attention to developing a stronger team, and checks up to see that it is done, there should be worthwhile results. All the carefully designed staff programs in the world will fail if spontaneous executive leadership is absent or given in short measure."

The second is the conviction of the entire supervisory organization that the program is important and that each supervisor's own progress will depend in part on his success in helping the young men to grow. As Ralph S. Damon, president of Trans-World Airlines, recently observed, "Even with the qualifications necessary for management leadership, many prevent their own promotions

by failure to create a competent assistant for fear he will outshine them. Training someone behind you to take your job when your time comes to be promoted or transferred to a better job is the best way I know to get promoted."

The third condition precedent is that the personnel department or whoever is placed in charge of the training program be advised just what is expected of the program, how much time it has and what it is expected to achieve.

The fourth condition is that the program be followed up. In Creole Petroleum, a leader in the field of executive development, the program is assigned to an executive vice president and three members of the board of directors, who follow it constantly.

The executive's job is to know the operations and potentialities of his company, to be aware of its objectives, to direct its officers and employees to the most profitable achievement of those objectives, and to assume the responsibility for accomplishing this.

If this is an accurate statement of our goal, then the purpose of a training program should be to convert the trainee into just such an executive. This means that the program should be designed to:

- a) Teach him the business as it is;
- b) Make it possible for him to see the company's potentialities;
- c) Advise him of the objectives of the company's activities.
- d) Train him to work with others;
- e) Impress upon him the importance of profits, and
- f) Instill in him the feeling of responsibility.

Let us consider how we can best achieve each of these purposes.

Unfortunately, it is extremely difficult to teach a man a whole business. There are few positions from which any person can even see the whole company.



BACON HITS THE SPOT was the verdict of this attractive Boss representative after she had served thousands of conventioners.

Many large companies have so many divisions or departments, so many separate functions, that only the few top executives are familiar with them all. This leads many companies, particularly large manufacturing concerns, to conclude, as the army commands of every country have concluded, that the trainee should be installed in a staff function or even appointed an assistant to one of the senior executives. "A Pershing makes a Marshall, and a Marshall makes an Eisenhower," as Crawford Greenewalt has stated. This, of course, appeals to the trainee as it places him close to the boss, and it may appeal to the boss for it gives him an opportunity constantly to observe and appraise the man who is being given the training.

On the other hand, some of your companies have centralized your operations and have very few "staff" activities. Such organizations must train their men in "line" functions. Indeed, there is merit in line training in any type of organization as it ultimately brings greater knowledge of the actual "operations" into the executive offices, almost always a desirable goal.

In an ideal situation, you might move the trainee from one line activity to another so that he may have one or two years in each of the several principal divisions, and give him one or two years in a staff function some time during the training process. The purpose of the training is to give him a knowledge of the company as extensive as possible, but not necessarily intensive. As Crawford Greenewalt pointed out:

"There was a time when the boss prided himself on personal experience with every job in the shop. If this view ever had merit, it has long since become entirely unrealistic. Today, specific skill in any given field becomes less and less important as the executive advances through successive levels of responsibility."

At the same time, some skill, or at least familiarity with more fields, becomes increasingly important. For this reason, while a training program which confines the trainee to only one division, such as marketing, may prepare better salesmen, it is less likely to produce executive leaders as is a program which rotates the young man through all divisions, if only for a year in each.

Learning the business as it is may not be enough. Merely continuing the existing methods and practices in a world of constant change may lead to disaster. To broaden the trainee's understanding of what other companies are doing, or can do, many concerns send their executive prospects to university executive development courses.

Last year the National Industrial Conference Board reported on such courses currently given at Carnegie Tech, Columbia, Cornell, Georgia, Harvard, Houston, Indiana, Michigan, Northwestern, Pennsylvania, Pittsburgh, Stanford, Texas A. & M., Washington, and Western Ontario. The subject matter of these courses generally may be outlined as follows:

1. The Process of Being an Executive: a) Policy formulation; b) Executive action; c) Administrative practice, and d) Organization and control.
2. Business Functions: a) Marketing management; b) Management of operations; c) Accounting and financial administration, and d) Statistical planning and control.
3. Human Relations: a) Labor relations; b) Com-

munications and training, and c) Employee selection and development.

4. Public Relations: a) Community relations, and b) Business-government relations.

5. Personal Development: a) Conference leadership; b) Reading and public speaking, and c) Music appreciation.

Many companies find university programs to be very valuable both in their formal courses and in the incidental "bull sessions." Such courses also lead to worthwhile personal relationships. Beyond the information and contacts acquired through the use of such schools, the trainee may benefit from the fact that merely sending him to such a school creates a heightened sense of dignity and a feeling of personal responsibility.

Every employee is given an interpretation of the company's attitudes and objectives from the first day of his employment. From his co-workers in the factory, from his foreman or department manager, he hears expressions of their attitudes as to the company and its objectives. Not all of these are favorable, although some may be as accurate as the resoundingly worded "official statements of policy."

While official statements may serve a function, the best means of learning the objectives is by contact with the men who set those objectives and daily implement them, the current chief executives. In an ideal program, the young trainee would periodically come in contact with such senior officers and in some companies, like Inland Steel (where the trainees are known as "Randall's Rangers"), the chairman and the president make a point of meeting with the trainees for this purpose, but unfortunately this does not seem to be a very common practice among other companies. Most chief executives are too busy running their companies. A satisfactory alternative may be weekly, monthly, or quarterly group meetings at which one or more executives just below the top echelon can discuss the company's objectives, its current problems and plans, and answer questions.

Such meetings, better than any carefully worded release, will transmit to the trainee the company's actual objectives.

As the trainee is moved about the company and becomes a part of several successive teams, he will learn something about people and he will learn how to work for and with others. However, to develop such trainees further, it may be wise, to the extent possible to assign

them other duties in connection with the company magazine, its social activities, or athletic activities where they will have the responsibility for planning, organizing, or executing projects which may be of minor importance but require acting through other employees. This experience may be broadened by having him participate in Red Cross, Junior Chamber of Commerce and other activities where he may have executive responsibility long before he is ready for it in the company.

The primary purpose of a business corporation is to earn a profit for its shareholders. Yet today many organizations are so large and the various departments so self-contained, that there is a tendency for some department managers to measure their accomplishments by standards other than overall profits. Thus, the production department is likely to seek the lowest possible scrap loss even if it means slowing down production. The credit department may seek to avoid credit losses even though it means refusing profitable sales, and it is possible that even some men in management may be more concerned with the continuation of past practices (and indirectly the maintenance of their positions) than they are in profit-making. Such attitudes cannot help but be reflected in the attitudes of the younger men trained in such an atmosphere.

Many techniques are used to overcome this. Perhaps the best method of instilling enthusiastic interest in the company's profits is to relate each supervisors' own compensation to the overall profits and his particular contribution thereto. Sears, Roebuck has done one of the outstanding jobs in the United States in this respect and, as a consequence, has developed an outstanding group of men, each of whom has all of the enthusiasm which he would have if he were running his own business. Yet very few other companies have followed this course.

More emphasis is needed in creating interest in the company's earnings. The high degree of profit earned by many corporations in the past two decades, combined with the carelessness of expense which resulted from the high excess profits tax rates, has dulled the sense of management and obscured the minds of many young men to the fact that the company exists only for one purpose. Every opportunity should be taken to impress this upon the mind of the future executive.

During this period of training and early development, the management looks upon the young man as a trainee and as one who is performing relatively unimportant tasks, looking to the future for the young man's greater



ALL SMILES, probably over the success of the firm's "Cheezdog," are these members of the convention delegation from the Little Rock Packing Co., headed by their president, Chris Finkbeiner.

usefulness. While the young man is ordinarily willing to adopt this same philosophy for a while, he cannot always take an equally long range view. As the dean of the Graduate School of Industrial Administration at Carnegie Institute has pointed out:

"This learning and waiting period is a very dangerous one for the first-rate man who has just come out of professional school where he has been exposed to several years of continuous intellectual stimulation. The drastic change to a routine job that puts virtually no pressure on his intellect leaves a vacuum that will inevitably affect his morale and his whole pattern of behavior. For a while, just assimilating information about a new environment and about the company will keep the man alert. But this stimulus pales after a while, and there is serious danger that the dullness of routine will soon begin subtly to cloud over the basic habits so heavily stressed in a good educational foundation. At the end of five years, the well-educated young executive prospect may well have lost the intellectual and personal habits that underlie executive growth and what has been developed is just another good routine worker. Only young men who are most strongly trained and motivated in intellectual alertness survive these years intact. The mortality rate, and the real cost to industry, are enormous."

The greatest cause for this feeling of frustration in a young man is his realization of the comparative unimportance of his assignment. He does chores that he knows less able men could do. He does not feel that he is using his imagination or judgment to the maximum or that they are wanted by the company.

We must remember that our young men are at their most imaginative age and are much more fertile in ideas than they will be by the time they are actually executives, for as the judgment curve ascends, the curve of imagination descends. Even if their judgment is not yet mature, it is of importance to the company to do what it can to develop their sense of responsibility.

In the earlier stages, before the young trainee can be given great authority, it may be very helpful, as he moves about, to require him to write an analysis of the operations of each department to which he is assigned and ask him questions for the improvement of its operation. Inland Steel, which has such a program, finds that such required analyses tend to make the trainee more observant of, and interested in, his work and to feel more responsibility. Furthermore, they very probably will re-

sult in valuable suggestions.

One means of increasing the feeling of responsibility, used first by McCormick & Co. in Baltimore and more recently by Industrial Tape Corp. and others, is the "junior board." The ablest young men are elected to a board which has freedom to review and make suggestions relative to all aspects of the company's operations. At McCormick, the junior board (and a somewhat similar factory board) has, in the past 20 years, originated over 5,000 suggestions, all but 50 of which have been adopted by the regular board of directors.

"Man does not live by bread alone." I am certain that more young men leave businesses because they feel a lack of an opportunity to express themselves, a lack of responsibility and authority, than leave because of dissatisfaction with the pay scale. To get good men, to keep young men, to get more out of young men, and, above all, to develop young men, give them responsibility of their own and share some of your own responsibilities with them.

It is the usual practice to treat the trainees as a group for the first period, perhaps a year, during which they travel through the company's various plants or may all go through an identical series of departments. Ultimately, however, the period of this formal training ends, the trainees are dispersed and each young man is expected to be a useful productive worker in whatever department he is assigned.

From this point forward, each should progress only on his own merit. Actually, however, they remain marked men. Both the personnel department and the front office have an interest in them. They are given special supplementary training, and they are the most likely candidates for advancement. It is of utmost importance to the company that they not be advanced automatically to the exclusion of others. Somehow their ability, their industry and their knowledge must be accurately measured.

At Inland Steel, each department through which a trainee passes provides a general evaluation of his attitude, personality, etc. This gives a composite subjective judgment. This is then related to his reports, initial interviews, psychological report, and his own evaluation of his ability to fit into the organization.

The trainee must not only be tested once, but this must be redone from time to time. As one banker has said, "We would not think of lending a company money on an appraisal made some years ago. On the same basis, we should not tag employees early in the game and let



"WHAT TIME DOES the livestock session start?" seems to be the question as packers get together in the foyer leading to the Red Lacquer room on Friday afternoon.

"THIS IS HOW I do it," and "What do you think of this idea," set the tone of the informal meeting of purchasing agents as they exchange ideas over a cup of coffee.



the tag stick; we should re-examine them periodically."

If you have an executive development program, you will want to be sure that it is actually accomplishing the objectives for which it was initiated. Every such plan is not automatically perfect. Indeed, it may have several serious defects. It may give rise to a "souped up" high tension atmosphere that causes men to be overly occupied with their careers and chances for promotion or it may be weighted down with a mountain of forms and paper work.

There are several types of evaluation methods in current use: a) Employee attitude surveys by means of questionnaires are used at the Koppers Co., Inc., and Consolidated Edison; b) Employee analyses by interview are used at the Detroit Edison Co.; c) Statistical reports on the number of reporting jobs for which replacements are available are used by Esso Standard Oil; and d) Reports of the extent to which within company promotions come from the trainee group are used at Johnson & Johnson.

This last test may be badly misleading for once an executive trainee program is started, the management is likely to become so aware of, and interested in, the trainees that promotions may come almost exclusively from such ranks. A high proportion of promotions from this group may not be so much proof of the success of the program as evidence of a failure to keep other paths open for promotion. Perhaps one of the best methods of evaluating a plan, which has been in effect for some time, is that used by the Detroit Edison Co. which conducts two surveys as to the effectiveness of each graduate trainee, one survey among the employees and one among the supervisors. Evaluation of such programs is not scientific but then neither are the programs, nor indeed is business management. Nevertheless, the time and effort involved in such a program require some method of appraisal of its success.

Let us assume that your program is successful. You have prepared several excellent junior executives. There is an opportunity to advance one of these to a top spot. You consult your records, review the ratings and must make a choice. Of the several equally well equipped and well trained young executives, it is often the one who is "best liked" that is promoted to the senior level.

The need for development does not end upon one's election as an executive. Knowledge of the company's

affairs is not enough for as Sidney Swensrud, president of Gulf Oil, has said: "The men who come into management must understand the whole sweep of modern economic, political and social life."

The director of the University of Michigan's Bureau of Industrial Relations has made the same point and added: "For this reason it is salutary from the public point of view that one phase of executive development in a number of firms is concerned with political economy and with the relations of government and business."

While it is a subject warranting the full attention of a series of these conferences, suffice it to say that there has been a great change in business, in businessmen, and indeed in our entire society in the last few generations. For the last two centuries, throughout the western world and particularly in the United States, "business" has exerted a primary influence in society.

Businessmen's decisions, arrived at strictly on a business basis, determined where a railroad would run, which mountain would be mined, what wage rates would be paid, what taxes agreed to. Such business decisions determined the areas of the West to be opened, where cities would be built, what the living standards would be and the extent to which the younger people would be educated.

Yet, despite the importance of their role, businessmen were neither conscious of their own social influence nor articulate in the expression of their beliefs. For several generations the press of business prevented them, and the miracles of their accomplishment discouraged others, from making any critical evaluation of the businessman's social role. Then the great depression challenged the propriety of the dominance of business; a new administration took away from business a large part of that power and further consolidated its position during the emergency of World War II.

Today the I.C.C. would decide where the railroad would run, what territory should be served. By fixing the price at which it would stockpile the metal, the government would now determine whether a mine would be opened at all and by granting or withholding certificates of necessity would influence which mountain would be mined. The government today by minimum wage laws affects the wage rates and through welfare programs influences living standards. The governments, state and local, determine the local taxes and establish the educa-

tional standards for people in their jurisdictions.

The decisions once made by business, strictly on a business basis, are now largely made by the government on other bases. In many ways this change may be an improvement for the whole of society, but one of its results is to reduce greatly the influence of the businessman.

As a class, we businessmen only now are beginning to recognize that this change has occurred and cannot be undone. It is not enough to say, with Talleyrand, that "No one who did not live before the revolution has known the real sweetness of life," for the events of the past 30 years are irreversible and, if we are to prevent a direct and rapid drift into socialism, we must not only become more articulate but we must go much further and both declare and live by an affirmative creed. "Damn Roosevelt" was not, and is not, a complete socio-economic philosophy. If we men of business don't develop a more complete understanding of our functions, the function of private property and of a free society, we might as well forget these speeches and merely "drink and be merry" for on succeeding tomorrows our society will slowly but surely die.

The purpose of every business is to make a profit, but important as is today's profit, it is insignificant in comparison to the maintenance of a society in which profits are both politically permissible and economically possible. Hence, it is important to every corporation which anticipates continuing in business, that it do what it can to preserve our free society. It can work to this end only through its officers and they can accomplish no more than they understand. How much do they understand? Perhaps we find a partial answer in the very limited influence which business has exerted in political affairs in the last 25 years or its lack of any rallying cry more exciting than "maintain the status quo," which is a remarkable slogan for businessmen in view of the fact that many elements of the present status were enacted by the "new deal" over the strenuous objections of these same businessmen.

I think you will agree that we need to develop the executive's philosophy, his interest in, and understanding of, the role of business in our society.

How? There is no sure way and, indeed, almost no precedent, but there are some tools you can use.

You can encourage the current chief executive to live by his own philosophy and explain it to his younger executives. As Albert Schweitzer once said, "Example is not the main thing in influencing others. It is the *only* thing." It is of primary importance that the current executives by discussion and precept instill in the younger men an understanding of, and a dedication to, those principles upon which our society rests and a conviction that they can be made to work better and for more people.

The chief executive should introduce your younger men to those men of broad vision who occasionally visit your company or your city.

You can encourage your young executives to read more in this general field and perhaps establish organized reading and discussion groups.

You can send them to a well-organized executive discussion program. To my mind, the best of these is the Aspen Executives' Program at Aspen, Colo. There, in company with outstanding leaders in the world of economics, education, government, labor, religion, science and the arts, small groups of businessmen, by readings and discussions, explore the bases of our society and, without reaching any group decisions, develop greater knowledge, better understanding of their own philosophy and greater confidence in the strength of our society.

The young executive's development of such breadth of interest, understanding, and vision will help your company. It will help preserve our society. In the days of trouble and disaster, in the days of personnel disappointments, proxy fights, strikes, casualties and growing losses, and in the days of that loneliness that only the boss can know, a bit of philosophy may even help the executive himself. It will also give him greater confidence in the validity of the bases of our society and greater pride in his very important role in that society.

With your assistance, we have now hired a boy, taught a young man our business, trained an executive, developed a business leader and sent him forth to save our society. Perhaps that is enough for today.



SO DENSE WERE the crowds at this year's record-breaking convention that about the only way to move through the lobby speedily before or after a meeting was to stay behind one of the industry's big men, such as H. H. Corey, as he moved along.

Antibiotic Prolongs Meat Storage Life

• Antibiotics for agriculture have been a subject of constantly increasing importance in recent years. Of major significance in this fascinating development was the advent of the so-called broad spectrum antibiotics. Readily recognized as of unique value in the restoration of a sick animal to good health, the real barnyard revolution occurred when these antibiotics were mixed into the feed to give a daily intake of antibiotic very much less than therapeutic levels.

At these low levels of about 10 p.p.m. antibiotic in the feed, dramatic improvements in the rate of weight gain and hence in the decreased time necessary to bring the animal to market were readily observed.

So for over five years our company has been selling aureomycin chlortetracycline for use in feeds intended particularly for poultry and swine. Most recently, in comprehensive field studies involving thousands of cattle and sheep, similar benefits were shown, pushing this rapidly expanding frontier for the usefulness of aureomycin definitely into the ruminant field. Now for a modest investment, such as 1¢ a day per head of cattle and 1/3¢ per day per head of sheep, the grower saves feed, saves time, increases his yield, and delivers a healthier animal to the packer who, in turn, will find a significantly better dressing out weight.

While all this work has been going on in the barnyards and feeding lots across our country and to an increasing extent in other countries of the world, the basis was being put down for perhaps another whole new technology for aureomycin chlortetracycline. This is in the maintenance of freshness of foods such as the red meats, poultry and fish.

What do we mean by the term "maintenance of freshness?" Or perhaps we should ask first, "What do we mean by freshness?" Are we concerned with a fixed time concept in the handling of our food or is it a quality associated so often with a time relationship? Traditionally, for fish, doesn't freshness mean "right out of the lake, stream or ocean?" For poultry, right off the killing or eviscerating line? For red meats, to see the cuts made from the processed carcass right before our eyes? And what is the common denominator in all this? As few bacteria as possible in or on each of these commodities at the time we want to eat them.

That, principally, is what we mean by freshness. Increased bacterial growth then means decreased freshness, and the time concept associated with freshness has been important because the less time in getting the commodity to the consumer, the less time for bacteria to grow out in or on the commodity.

Now when we speak of the "maintenance of freshness," we really mean "to keep the bacterial population in our food as nearly as possible at the level when life left the healthy fish, poultry, meat, etc." But this is not easy, for when life leaves, the defensive mechanisms of the body which have been holding this bacterial growth in



DR. MILLER

check now cease to function. Thus, the bacteria are free to grow in an effort to spoil the food.

Refrigeration works against these bacteria which grow slower the cooler the temperature and, of course, freezing stops most of them right in their tracks. Rapid transportation helps because it shortens the time in which the bacteria can grow out in the food on its way to the consumer, and good sanitation helps because it minimizes the chances for additional bacterial contamination of the commodity. But all these may not be enough for, even if the food has not spoiled, all too frequently bacterial action still may have caused the downgrading of the commodity from a prime quality status.

Hence, the double interest in avoiding (a) downgrading or (b) spoilage by the use of the most modern of anti-bacterial weapons—the broad spectrum antibiotics—so-called because they are effective in retarding the growth of a wide variety of bacteria.

There is not time today to detail all of the extensive research in laboratories of several countries concerning the use of antibiotics for food preservation. The story begins in the laboratories of the Canadian Pacific Fisheries Experimental Station in Canada where in 1944 Dr. Hugh Tarr and associates reported on compounds related to penicillin. As other antibiotics became available, they were tested.

By 1950, with several broad spectrum antibiotics now available, Dr. Tarr could see some practical promise in this field. Work continued and in March, 1954, he published that "chlortetracycline was more effective in preserving such foods than any of 14 other antibiotics



WHO WOULDN'T BE GLAD to nibble a sausage proffered by this First Spice lassie?

studied." Only three weeks ago at the International Antibiotics Symposium in Washington, D. C., Dr. Tarr stated, "In our experience, oxytetracycline (terramycin) is only one-fifth as active as chlortetracycline (aureomycin) for flesh food preservation and tetracycline (achromycin, terracyl, etc.) is less active than oxytetracycline."

In the red meat area, work on the broad spectrum antibiotics went on almost simultaneously and in particularly detailed style in the laboratories at Ohio State University. By 1953, Dr. Fred Deatherage and associates were publishing their findings. They also concluded that aureomycin chlortetracycline was the antibiotic of choice. This work involved studies on the effectiveness of various antibiotics against 92 spoilage organisms from beef wherein it was shown that aureomycin inhibited the largest number of organisms—81.

Then rounds were infused with this antibiotic, and, finally, whole animals were infused immediately after slaughter. When one side of such animals was refrigerated immediately and the other side was left 48 hours at room temperature, a tenderness difference could be observed between corresponding cuts from the two sides as well as some color improvement in the non-refrigerated side. In these studies, 6,000 lbs. of beef was consumed by known persons without any adverse effects.

In June, 1954, Kohler, Miller and Broquist of our organization reported at the Institute of Food Technologists annual meeting on the effectiveness of various antibiotics to maintain the freshness of poultry. Again, aureomycin chlortetracycline appeared the most effective. Forty-five Pearl River (N. Y.) families ate birds so processed and then held three weeks in packages refrigerated under commercial storage conditions and did not distinguish them significantly from fresh killed birds.

In all these papers, data were presented to show the contrast in bacterial counts between the control of unprocessed fish, beef or poultry and that which had been

processed with aureomycin. The longer the time from killing, the greater was this contrast. The development of odors and deleterious changes in other qualities associated with organoleptic evaluation paralleled the bacterial count. It thus appeared that aureomycin chlortetracycline did indeed help to "maintain freshness," did not bring any adverse changes in color, odor or taste of the processed commodity and should be evaluated in as extensive field trials as possible. Time permits the telling of only a few highlights from our field experiences.

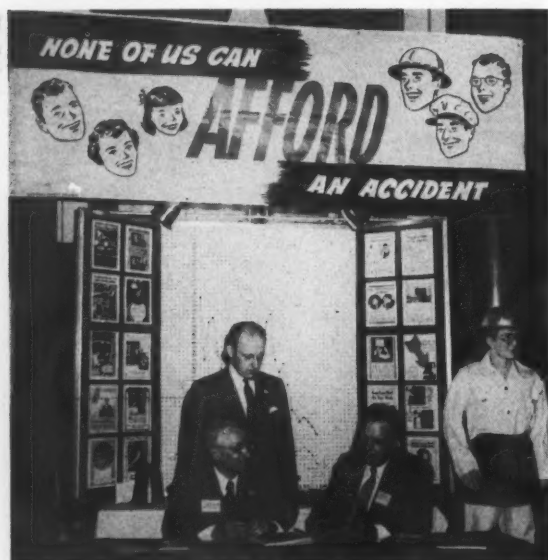
In using chlortetracycline in field trials, it was desirable to fit the processing of the fish, poultry or meat with chlortetracycline into the presently accepted ways of doing as much as possible. It soon became apparent that formulated products of chlortetracycline would be most useful. A special food grade of the antibiotic was designed and the various products containing this grade are designated by the trade mark of Acronize.

For fish, we have devised ices, dips and sprays. Of these, it would be expected that an Acronize ice would fit in most generally with present day operations aboard ship. Our laboratory staff members set to work and were soon successful in developing a formulation which would give a uniform dispersion of chlortetracycline in the commercial ice cake. They reported their work at the Gulf and Caribbean fishery meetings last November in Havana. The process is quite simple and involves only the addition of about 4.5 grams of our formulated product (carrageen, calcium acetate and chlortetracycline) to the freezing cans along with the water necessary to make a 300-lb. cake of ice. We have made this ice on a trial basis in ice houses with a broad geographic distribution and so long as the iron content of the water was low, we experienced no difficulty.

For poultry, we have a dip. Poultry increasingly are eviscerated on a production line basis and after thorough washing are then cooled in tanks containing an ice-slush mixture. We have found that, if this cooling mixture contains 10 p.p.m. of chlortetracycline, the poultry will absorb sufficient antibiotic to maintain freshness from 14 to 21 days when the birds are packaged as they are removed from the cooling bath and then stored under commercial refrigeration. This is a significant increase in the period of acceptable salability according to present standards.

For beef, Dr. Deatherage has published information concerning an intra-carotid infusion technique. The infusion solution containing chlortetracycline should be isotonic in salt. Other possibilities on which we have done work are a product for injection prior to slaughter and a product for spraying surfaces of the meat after dressing, after cutting up, etc.

As we have used these products, we have recognized that the advantages of this new technology can come into clear focus only after extensive commercial use. Fish, poultry and red meat animals are biological specimens and as such are subject to considerable individual variations in behavior patterns from birth even through the storage period after death. Therefore, the larger the numbers involved, the more significant the average. There is the further factor that during the handling of large numbers of any commodity, there is not likely to be the care exercised in dealing with individual specimens as in small scale trials. However, to date, we have accu-



SAFETY ACTIVITIES of the Institute were centered at this lobby booth where R. A. Harschnek of Swift & Company and Richmond Unwin of Reliable Packing Co. (seated) confer with John Kato of the National Safety Council.

mulated detailed experience in the thousands for fish and in the hundreds for poultry and beef animals. We have seen a significant increase in the maintenance of freshness in a high percentage of all our work.

For fish, most of our results have been obtained using an ice containing 5 p.p.m. chlortetracycline. Our trials have been conducted over a wide geographical area within the United States although we also are collaborating in work in several other countries.

Scrod haddock caught and iced on boats sailing out of Boston and New Bedford had a week longer at top quality, judged by bacterial count and organoleptic tests, when iced in our antibiotic ice than did fish caught at the same time and placed in ordinary ice.

Halibut and salmon were caught in waters off the state of Washington and iced as they were caught, some in ordinary ice and some in ice containing 5 p.p.m. chlortetracycline. Maintained in such ices during the transcontinental trip to New York in refrigerated cars as is commercial custom, the contrasts in color and odor were readily apparent on arrival. The estimated extension of shelf life due to our antibiotic ice was again about one week.

Other varieties of sea foods for which we have detailed stories showing positive benefits from chlortetracycline are red snapper from the Gulf of Mexico; black bass from the Jersey coast, sardines from Maine and shucked oysters from Chesapeake Bay.

The results of our various trials suggest the possibility of landing fish which have greater freshness and more uniform quality even though obtained from areas which may be further from present ports.

For beef, we can take some pride that in cooperation with Ohio State workers and an enlightened operator in one of the warm climate countries, we have set up and observed this method in operation under practical field conditions there. Animals were dressed out and were hung 72 hours in the shade of the open slaughterhouse before being refrigerated. Other animals freshly killed were transported in the evening and during the night nearly 400 miles in a non-refrigerated truck to be unloaded into the cold room less than 24 hours after killing. And we can verify that meat like this which was allowed to hang at room temperature for a couple of days does indeed have a readily recognizable contrast in tenderness

over meat placed under refrigeration immediately.

We also have seen some indication of improved maintenance of color in our meat processed with chlortetracycline.

These experiences suggest possibilities of importance varying with the degree of development of the country, the location of the meat growing areas relative to the meat consuming areas, etc. But we have seen enough to believe that some countries now on a 24-hour basis for the handling of meats may go to a 72-hour basis or perhaps longer for Dr. Deatherage reported in Washington at the International Antibiotics Symposium three weeks ago that infused rounds had stood at room temperature as long as nine days before spoiling.

For poultry, we have confined our processing to birds which are eviscerated. In this way, chlortetracycline enters the tissues to protect all the surfaces where bacteria may grow, extending uniform protection as the bird passes through the various distribution channels to the consumers. Our processed birds in packages have been checked through these channels often several hundred miles long from processing plants in several states in the eastern and midwestern United States to wholesalers and stores.

Without entering commerce, they have been held in certain stores to see how long first quality freshness would be maintained under practical conditions. After the initial chilling in the ice-slush bath, the birds are held usually in the vicinity of 40° F. as they are transported and stored. In controlled studies, as I have told you, 45 families in Pearl River have eaten birds three weeks old and have not differentiated them successfully from birds one to two days old purchased in commercial channels. Perhaps in large-scale commercialization, one may not need nor find such extended periods for maintaining acceptable freshness of poultry but this study at least gives a measure of the possibilities for improvement in view of the estimated average acceptable shelf life of about seven days under normal commercial handling without chlortetracycline.

In the use of any anti-bacterial agent, the fewer the bacteria, the more effective a given amount of the agent can be. Conversely, if the bacterial load is too high, the anti-bacterial agent may be of questionable value. The conditions to insure as low a bacterial population as pos-



STEADY STREAM of scientific and semi-technical booklets and pamphlets, now pouring out of the American Meat Institute Foundation as a result of meat industry research being carried on there, was sampled in this literature display. Many packers stopped to examine material telling how to make better products more economically.

sible are (a) to have good sanitation, and (b) a fresh-killed commodity. This should be the situation when the processing with chlortetracycline is to be carried out, for even under the best of such circumstances, freshness cannot be maintained as long as when chlortetracycline also is used.

It is to no one's advantage then that the beneficial effects possible by the use of chlortetracycline should be lost due to improper practices. Rather, the use of chlortetracycline should give added incentives to raise standards of sanitation and of the general techniques of handling foods, since this antibiotic, based on our laboratory and field studies, appears to make possible new standards of freshness for the consumer.

To assist in the achievement of such a goal, we want to see our products used in accordance with our quality control requirements as part of a larger franchise agreement. In that way we hope to achieve a uniformly processed commodity. We recognize that these quality control requirements may well be changed from time to time as our experience accumulates, but our goal will always be as it is now—that the food uses of chlortetracycline result in a better product than ever before for the consumer.

And now just a few words about the safety question. Chlortetracycline is unique as a candidate for an additive in human foods in that, under the trade mark aureomycin, a vast literature already has been developed and continues to increase simultaneously in human medicine and animal agriculture at levels of intake much higher than those levels proposed for use in the raw foods. Coupled with this has been the fact that we in the American Cyanamid Co. have emphasized applications of



STROLLING SAUSAGE bearer of Basic Food Materials found many packers ready to sample her wares.



WHEELS OF INDUSTRY stop rolling around the convention for a moment to discuss something momentous — or maybe just share a story.

chlortetracycline for those foods where protection is desired up to the point of cooking. Because chlortetracycline is heat-labile, cooking would be expected to destroy the antibiotic, so negating the theoretical possibilities of the sensitization of the consumer to the antibiotic and the emergence of resistant strains of bacteria in the consumer of the food.

However, in any application it is well to consider a margin of safety. Assurance is seen in some reports from the medical literature wherein reports of daily intake by humans at the rate of up to 35 grams of chlortetracycline per 70 kg. body weight are recorded. Lower dosages, such as 0.5 g. per day, taken continuously under medical supervision over a period of years by humans, varying from young school children to geriatrics, gave only beneficial results.

This indication of safety is further buttressed by years of animal work wherein billions of swine and chickens have consumed antibiotics to speed their growth by cutting down sub-clinical types of disease. And now, as I said earlier, we have the latest work in our company which points the way for new benefits from aureomycin chlortetracycline in the production of both cattle and sheep.

But to get back to our original approach to this question of the use of antibiotics in foods. With extremely sensitive microbiological assay procedures, it is possible to detect as little as one part of active chlortetracycline in 40,000,000 parts of flesh. We have amassed a very great amount of data showing that under every conceivable method of normal cooking of one commodity—poultry—this relatively harmless chlortetracycline becomes inactivated beyond the point of detection in the meat taken from different parts of the carcass. Other authors have published data on the dissipation of antibiotics from the flesh of beef and fish, either or both, during storage and cooking.

It is this approach which we hope will soon make possible the introduction of chlortetracycline into commerce both in the United States and abroad to give significantly increased protection against spoilage by retarding bacterial growth up to the point of cooking in those commodities which are not eaten raw.

Promotion Planned for New Antibiotic

• You have just heard from Dr. Miller some news concerning what we regard as a tremendous scientific development. My few added comments will, in part, complete the story. We think it important that we tell you some of the things which American Cyanamid plans to do, both to control this process and to promote it. We also would like briefly to point out some of the marketing and some of the operational opportunities for the meat industry as we see them today.



B. BOWMAN

American Cyanamid Co. plans to promote Acronize on a franchise basis. This means that only a limited number of processing plants will be using the Acronize process. In this selective approach it is obvious that our purpose is to maintain a high standard of quality and to avoid chance of the material being used in place of sound and sanitary processing operations and conditions.

Our franchise contract has been prepared with this in mind. In addition, as a part of each franchise contract, there will be a set of carefully prepared quality control requirements with which the processor should continuously conform.

Our present plans also contemplate some promotion of Acronize to the consumer. We may use a variety of promotion, including certain types of advertising and public relations material.

Some of our promotion for the consumer will be technical, for use by technical writers, science writers, food editors, columnists and so on, and some will be of a direct type, but all will have as its purpose the creating of the concept of what the Acronized label on your products means for higher quality products and greater uniformity.

We also should tell you that, insofar as practical, we plan to identify every meat item processed with the specific process. In view of the fact that the consumer will, we hope, have an understanding of what the label signifies on your food on your product, we think it important that this label appear on the product to enable her more quickly to identify those products which have qualities resulting from the process.

The individual labeling of meat products also enables the distributor and the retailer to be more selective in their choice of sources of supply, and it enables the processor to identify his product as having the benefits of this process.

We obviously plan to develop some promotion with grocery store chain outlets. As you know, chain outlets today are the major outlets for poultry and meat products. We hope to induce them to tie in with our promotion and to do some local point-of-sale promotion on their own. Certainly, the process does afford chain outlets promotional opportunities which they have not had before, and, perhaps of greater importance, it opens up extensive solutions to operational and distributional problems on fresh meat products with which they have been confronted for many years.

At this point some of you quite naturally will ask the status of Acronize insofar as the federal government is concerned. Our scientists have submitted to the Department of Agriculture and to the Food and Drug Administration all the data requested so far, and it is voluminous. As of today, we are happy to tell you that a certificate of utility for Acronize has been signed by the Department of Agriculture. This leaves only the establishment of tolerances by the Food and Drug Administration to enable us to offer Acronize commercially for promotion. We anticipate early favorable government action on other logical and sound applications of the new products.

This naturally brings us to the question, "What does this all mean to the meat industry?" If, as our scientists have pointed out, this specific process does extend freshness for longer periods of time, there are many developments which may materialize. We have by no means thought of all of them, but the comments to follow indicate to you some of the things which it can do for you and your industry.

First, we think the entire transportation subject can be reopened and restudied. It may now be possible for you to ship to more distant markets than heretofore because of the protective properties of the process. It is possible that less expensive methods of distribution and transportation can now be permitted and the consequences of delay in transportation can be less serious. Finally, we think the frequency of delivery to storage centers or to store outlets can be thoroughly restudied, with the likelihood that daily deliveries will become a thing of the past and once-a-week deliveries a definite possibility.

We think, second, that inventory problems will become much less acute. It should no longer be necessary, after this development, for any retail outlet to run out of any fresh meat product. We are all acquainted with inventory problems and know that the quickest way to hurt a business is to have out-of-stock conditions. There are real problems, we think, to be solved in the elimination of out-of-stock conditions and the reduction of spoiling



MEMBERSHIP SERVICE was just one of the focal spots where AMI activities centered during the convention.



MOST PATIENCE-EXHAUSTING activity of the convention was getting an elevator — up or down. Other quick snaps here show a friendly pair; a cooler conference; "you ought to read this," and a chalk talk on hog prices.



processes in existing stocks of fresh meat products.

Third, and this is very important, prepackaging now can be permitted to a degree never before expected or possible. As you know, meat and produce are about the only remaining items which arrive at the supermarkets in bulk form. We understand that packers prepackage about 10 per cent of their output, but we know that over 40 per cent is sold through self-service departments in packages. This means that the difference must be packaged at the retail outlet, which may not always be efficient and may be expensive. Centralized prepackaging of fresh meat and poultry with less risk of spoilage is now practical and feasible with Acronize. We think you can do now with fresh meat what heretofore has been possible only with frozen foods.

Fourth, through the material, there should be opportunity to promote specific brands of meat products far greater than heretofore, with safe distribution and high quality meat products reaching the consumer.

It is no secret that today the consumer wants service, and she wants convenience, and she tends to accept certain brands which supply those qualities to her. We think that our process opens up new areas of consumer promotion by specific brands, because new product quality can be assured and for a much longer period of time.

Fifth, it logically follows that more emphasis can now be placed upon the point of sale, retail promotion and supply. With greater brand consciousness, coupled with prepackaged products, the stage is set for much more concentrated influence on the consumer, especially at the point of sale. We would expect this, logically, to result in increased consumption.

Sixth, we do not claim that Acronize is a cure-all, nor is it a guarantee in any sense, but as Dr. Miller pointed out, it does retard bacterial growth. After processing with the substance, handling and distribution of meats involves many people. If, after processing, all these activities are conducted as they should be, the consumer will receive a superior product. However, if the handling practices break down at any point, the built-in protection of Acronize, we think, still will give a better product to the consumer than she would otherwise receive. Certainly, its protective qualities may eliminate some of the problems found today.

Seventh, and finally, if as we hope, Acronize means better quality and more uniform quality, and for a longer period of time, is it not likely that greater consumer satisfaction will result, which could mean increased volume and faster turnover of meat products?

We expect and hope to see many of these things materialize, and we also hope that American Cyanamid will be a factor in assisting the meat industry to develop more promotion, more sales and more profits.

Heretofore, bacteria has been controlled with antibiotics in that part of the animal cycle from birth to processing. Now we can expect that bacteria can be retarded along a further cycle, from processor to consumer. Thus, through aureomycin and Acronize, the scope of effectiveness of antibiotics is broadened substantially. In this way we hope the material will be a further important step for you in contributing to higher quality, increased consumer purchases and improved economic welfare, all of which are major objectives of your industry.

AMI SESSION

LIVESTOCK

The Agricultural Program—U. S. Senator Bourke B. Hickenlooper, Republican of Iowa.

Live Hog Evaluation—Virgil E. Franz, head, provision department, Swift & Company, Chicago.

Effects of Hormones, Including Stilbestrol in Livestock—F. N. Andrews, professor of animal husbandry, Purdue University, LaFayette, Ind.

Farm Prospects Bright For Long Pull



SENATOR
HICKENLOOPER

• The problem of production, sale and distribution of farm products is one which always has varied with the economic situation of any particular period of time, and sometimes I think it is like slaying the fabled dragon of old only to find that each of his teeth produces a new dragon or a new problem of a difficult nature.

We are more blessed in this country so far as adequate areas of agricultural production are concerned than any other nation in the world. We have climatic range which makes possible vast areas for diversified products and vast areas for specialized crops.

Year by year our systems of distribution have expanded and adapted themselves so that our farm products can reach all parts of the country. We have produced abundant food in America and this has been a most important factor in our attainment of the highest living standards in the world.

There is, however, the ever present concern for maintaining the economic prosperity of the farmer. The search goes on constantly for a solution to the question of how to keep supply and demand, in the case of farm products, in reasonable balance so the producers can receive a fair price and the consumer can get food in plenty at a price he can afford to pay.

Thirteen and one-half per cent of the population of the United States is living on farms and farming is a most important segment of our whole economic structure. In fact, agriculture, devoting its efforts to the production

of food and fiber, constitutes the largest integrated economic unity in our country. There is no doubt in my mind that, as the well-being of agriculture increases or diminishes, other segments of our economy, in fact our whole economy itself, increases or diminishes.

The farmer has always been a rugged individualist; he resents dictation and control in running his affairs and over the years this quality of personal responsibility and his insistence on his right to run his own affairs has been one of the greatest safeguards of the American private enterprise system.

This fall, however, the farmer was caught in a squeeze which is, in our area in the middle west, at least, sharply pointed up by the low price of hogs and to a lesser degree perhaps by soft cattle prices. In the great bread basket area of our own middle west, this is hurting.

Low prices not only hurt the farmer but also the business man who supplies him and on up the line, and we are determined that a sound solution can be found to remedy the situation. Of course, if prices of all products decline at the same general rate, then the price the farmer receives for his products and the price he has to pay for the things he has to buy will remain in balance. But the situation the farmer finds himself in today is that the price he receives is low and the cost of everything he buys is going up. For him it is a pretty rugged time.

Basically, of course, the supply of meat in the country is practically determined by the amount of feed available. We have been told over the years that a better price is received by the farmer for feed grains when he feeds them to animals than when he sells grain as such, and I think generally speaking this is true, but there are exceptions. The facts are apparent this year, I think, when we realize that we have had abundant feed and have produced a corresponding abundance of meat animals. Supply and demand, therefore, steps in to influence the price. At the moment there have been more hogs going to market than the demand calls for and the price

of the live animals is, therefore, at a lower level than it has been for some time.

What do we do about keeping the agricultural economy prosperous? I suppose the simple answer to that is to find ways and means of disposing the products of agriculture at a good price, but this, in turn, requires that demand equal production and that markets are adequate.

We don't like waste, and vast giveaway programs are not the answer to the maintenance of a self-supporting program. At the same time the maintenance of high price supports with unlimited production can swamp us and, therefore, adequate price supports would seem to demand adequate control of the volume of production on the farm. But how to maintain such controls without putting the farmer in a straight jacket is a question that is troublesome, indeed.

As a member of the Senate agriculture committee, I can say that our committee has been aware of this situation and it is holding hearings over the United States now, 18 of them in all, in various sections. These hearings will be concluded shortly, and we hope that among the multitude of suggestions developed some reasonable answers can come.

Certain groups want to maintain high supports for meat animals but do not want controls at the production point. Other groups suggest rigidly controlled products at the farm with strict market limitations so far as numbers are concerned. Food stamp plans in vast proportions have been proposed. But serious objections to all these plans have been raised by equally interested and informed groups who claim that none of them will answer the question.

Manifestly, there are two outlets for our farm products, one domestic and the other foreign.

In the domestic market there are undoubtedly millions of people who through habit or from lack of proper dietary knowledge do not consume the proper kinds of food. If everybody in the United States ate a properly varied diet and especially consumed the amount of meat that is considered adequate, we would go far toward stepping up demand to equal supply, but that is a job

of salesmanship. I think that in the entire business of marketing meat, whether it be from the producers' or the processors' angle, an inadequate job has been done in selling the individual consumer on the necessity for and the food value of meat. If the whole meat industry had done a substantial fraction of the job of advertising our products that has been done by the citrus fruit industry, we would have no disposal problem.

Some smart people with pencils have said that, if every American family ate pork one more meal a week, we wouldn't have any pork problem, and, if we could get the American people as a whole to eat a reasonably adequate amount of meat and poultry, our difficulties would be over. Be that as it may, it certainly would be of vast help, and I think that our program of education will be stepped up along this line.

One of the most interesting proposals that have been made for dealing with the surplus problem, however, has been the so-called soil fertility bank plan or the retired acres plan. This plan contemplates that every producer who desires to participate in a substantial support program must lease to the government a certain percentage of his production acreage, somewhere between 10 and 20 per cent, for which he would be paid a reasonable rental based on its appraised value, but these acres would be withdrawn completely from commercial production. The soil would be built up each year and, as our population grows or increased needs occur from time to time, a certain portion of these retired acres could be released back into production. In that way the amount of food and fiber produced on the remaining acres probably would bring supply and demand into balance with good prices and still adequate supplies. This plan, I am sure, is going to be given a very thorough study by the agriculture committees. While the details of its operation would have to be carefully worked out, I believe there is much merit in this approach.

So far as the immediate situation of farm prices is concerned, a number of things are being done to help stabilize prices and to start them back up. Within the past few days the Department of Agriculture has begun the purchase of \$85,000,000 of pork and pork products. This, of course, is not a large amount of money in relation to the volume of sales, but I believe it has been and will be helpful. These products will go into the school lunch programs, institutional feeding outlets, etc. Efforts are being made to secure voluntary reduction, for instance, in the number of pigs to be farrowed this spring, and substantial efforts are being put forth to increase domestic consumption.

We are expanding the distribution of surpluses to schools and needy persons, and a great deal of work is being done to encourage the production of more products which are in greatest demand, in substitution for production of food and fiber which is in long supply.

However, I think one of the most important and hopeful programs is the disposal of our farm products abroad. For the last two or three years we have pushed this disposal program vigorously. In fiscal years 1954-55, our agricultural exports were up in dollars 7 per cent over 1953-54 and 11 per cent over 1952-53. These figures are in dollars, and, with declining prices, the volume was even greater percentagewise.

We have now, by amendment to the law, established



"C'MON PAL, it's time we had some lunch," seems to be the message the conventioneer is passing on to his friend.

a system of agricultural attaches in our embassies and missions abroad. They are just beginning to function and, while they are attached to each embassy, they report directly to the Secretary of Agriculture rather than through State Department channels. While they are just beginning to function, the results which I believe they will attain in developing new markets for our farm products should be very gratifying.

We also are attempting to break down the restrictions which exist in quite a number of countries against American agricultural products. We are making some progress along this line, and we are encouraged to think that a great deal more progress will be made in the future.

We also are encouraging direct sales to foreign countries with certain definite inducements. The Commodity Credit Corporation, under the provisions of law commonly referred to as Section 32, can use a portion of the 30 per cent of the gross customs receipts to stimulate the sale of agricultural commodities abroad. This disposal program involves mostly storable commodities, but it is also applicable to fruit and vegetables, etc.

Under the CCC disposal program we have sold recently such volumes of products as 10,000,000 bushels of soybeans, over 1,000,000,000 lbs. of cottonseed oil, over 650,000,000 lbs. of non-fat dry milk, and Commodity Credit stocks of edible beans, oats, barley, rye and sorghums are in the process now of being moved. I do not have the exact figures on these latter items, but they are being moved in substantial quantities.

In addition, we are successfully expanding the foreign market for corn, although this has not been great as yet. It, nevertheless, is in excess of the volume heretofore moved into foreign markets and the demand for corn probably will increase abroad.

We have three other important methods which have been coming into increasing use for foreign disposal. One is sales abroad for foreign currency which is not readily convertible into dollars. Under this program, we sell agricultural products and accept the currency of the purchasing country and use that currency for our own financial needs within that area or for the purchase in that area of goods for our use in other countries. The actual breakdown of the uses of these foreign currencies is as follows: for agricultural market development, purchases of strategic materials, purchase of goods for use in other countries, uses for common defense purposes, grants for economic development, payments of our own government expenses in that area, loans for economic development, and for the international educational exchange.

The Mutual Security Law last year provided for the sale of not less than \$350,000,000 worth of these agricultural surpluses for such foreign currency. Also, under an amendment to Public Law 480, an amount not to exceed \$700,000,000, was authorized for the sale of Commodity Credit stocks and later this amount was increased to \$1,500,000.00. Altogether, in fiscal year 1954-55, we disposed of a total of about 825,000,000 worth of these products at either export market value or Commodity Credit Corporation cost. Only a small volume of this total disposal was shipped during fiscal 1955, but the commitments have been in the process of shipment since last July and practically all of fiscal 1955 commitments have been shipped by now.

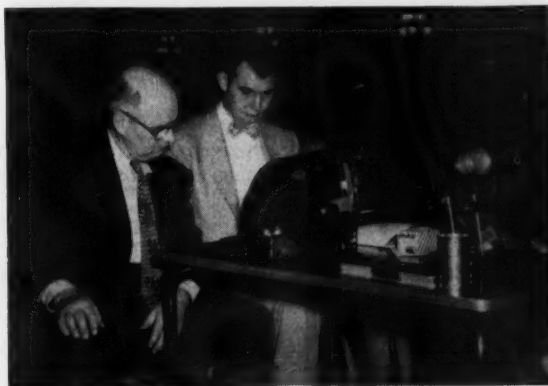
In the current fiscal year, we will probably sell at CCC cost to 23 to 25 countries somewhere around \$725,000,000 worth and the movement of these products will be expedited. We hope that more than \$500,000 worth actually can move in this fiscal year.

Another means of expediting and encouraging sales is the credit extended by the Export-Import bank. The bank is expanding its credit operation and is enabling countries that do not have sufficient, readily available capital to come in and purchase fats and oils and wheat and other grains as well as fiber such as cotton. I think the finance program of the Export-Import bank could well be enlarged further, but it is already an important source of credit for countries and purchasers abroad who have a substantial demand for many of our products.

Of course, we all read the papers and note that a most important disposal program so far as butter surpluses are concerned is the new market developed in India for ghee. How it is made, I do not know, but many people believe this outlet has great possibilities for the disposal of excess butter and butter fat.

We are taking some other steps which, I think, are bound to produce broader markets for our products, and that is our increased interest in the international trade fairs abroad. I have attended a couple of these and there is no doubt but that the display of American products and wares, especially food products, is creating a new demand and, given a proper credit system, will provide substantial increased markets. These trade fairs are not confined to Europe but are being held in South America and in Southeast Asia. They offer a fine opportunity for American promotion and sales.

Looking into the future, I feel that prospects for American agriculture, in the long pull, are bright although I am fully aware at the present moment that the financial picture is depressing. However, our population is going up some 2,000,000 to 2,500,000 per year. Even though more efficient farming practices, increased use of fertilizer and the rapidly unfolding advancements in farming, in processing and in distribution are great, nevertheless, our own increased population and a vigorous and proper development of the markets of the world should lay the broad foundation to enable us to maintain indefinitely a high degree of prosperity in this most vital segment of our American economy.



RIGHT OR UPSIDE DOWN ponder the projectionists over a slide during the engineering and construction section meeting.

Hormone Addition Gets Varied Response

• This question of hormones is not particularly new. In fact, you could address almost any group of livestock people by saying, "Fellow endocrinologists." They might think that you were insulting them if you didn't explain what endocrinology was so you should hasten to say that it is the study of hormones. Then give real credit for the discovery to the effects of these hormones long before their names were known. Very shortly after the domestication of animals livestock people began to practice both surgery and endocrinology because they discovered in some strange way that if the male animal were separated from the testes, the male stayed much closer to home. He did not attend conventions. And he didn't look over the other side of the fence.

At the same time, in spite of the limited feed available in the early years following the domestication of animals, the carcass quality of sheep and cattle and swine which had been castrated was improved. So for several thousand years it was regarded as good livestock practice to eliminate the source of hormones because these were associated with the wrong kind of carcass quality.

If you will think for a moment, there is no animal which grows more rapidly than a Holstein bull. Remove his testes and he doesn't grow anywhere near as rapidly. The Holstein bull represents pretty low meat quality in terms of Prime and Choice Cattle carcasses, but the presence of the male sex hormone secreted by the testicles or, just as well, the presence of the female sex hormones, would increase the growth rate. So hormones were being removed for another reason.

The female sex hormones are not new, nor are they limited in numbers. The female sex hormones are almost everywhere. They are present to a limited degree in grasses. They are present to a much greater extent in legumes. They are present often times in quite large amounts in alfalfa and Ladino clover silages and in forages, pastures. They sometimes produce very unfavorable results.

For example, in Western Australia where sheep were grazing almost exclusively upon a subterranean clover, which is related to certain clovers in this country although we do not actually have subterranean clover, this natural forage was so high in the female sex hormone content that it caused wether lambs to give milk; it caused the eversion of the uterus in the female, and it caused sterility in males and females.

Here was an extremely potent source of natural female sex hormones having a very undesirable effect upon the livestock which consumed them. We know they are present in certain moulds, and when certain types of mouldy corn are consumed by swine sometimes the females appear to be in heat constantly and do not become pregnant when bred by the boar. This is an undesirable effect of the hormones.

Going even further, they are found in a wide variety



F. ANDREWS

of plants, in the blossom of the pussy willow, in petroleum, and in the mud on the bottom of the Dead Sea. The point I am trying to make is that there is a great variety of female sex hormones and you may find them in the strangest places. Their effects, both good and bad, or no effects at all, depend primarily upon the level of hormones which is available to the animal.

What are the primary functions of the female sex hormones, such as stilbestrol, dienestrol, rexestrol, estrone? What was the original purpose of these female sex hormones in nature? Their primary function, and the one which gave them their original name of estrogen, meaning estros-producing, is causing females to come in heat.

A second important function is the development of the mammary gland in mammals because pregnancy is only one phase of the reproductive process in all milk-producing species. During pregnancy, due to an increasing amount of female sex hormones, the mammary glands become completely developed to take over the function of nourishment of the young after birth so that milk production, especially the preparation for milk production of the mammary gland, is initiated by these female sex hormones, and they have a role in maintaining the function of the entire reproductive system of the female animal.

In different species of animals, the effects of the female sex hormones can be absolutely different or even oppositely different.

It has been known since the early 1940's that female sex hormones like diethylstilbestrol, hexestrol and dienestrol, when fed to broilers, will improve carcass quality through increased fat deposition. On the Chicago market for a number of years there have been special quotations for broilers which have been treated with these hormones. Such chickens are called caponettes and more is paid per pound because they are worth more per pound.

Practically any housewife, or even her husband, can prepare one of these hormone-treated chickens quite satisfactorily because it is almost impossible to roast one



GLASSES IN MOUTH, this conventioneer concentrates on his program while AML staff member Larry Eldred twinkles by.

to death in the broiler. There is enough fat in this young chicken so that it is broiled in its own juice. This increased fat deposition is brought about specifically by the female sex hormones. If you treat a chicken with enough female sex hormone, you can increase the amount of fat in the blood so much that the chicken blood, instead of being red, looks just like so much cream and hardly flows through the vascular system.

But do not be fooled with the effects of the female sex hormones upon cattle and sheep and swine. In birds, the reason that the female sex hormones perform this function is that the female has to secrete in the egg enough material in the yolk to nourish a developing chicken embryo during the process of incubation. It needs to mobilize this fat for that purpose, but the mammal doesn't have to do this and furthermore it doesn't. So then in mammals—cattle, or sheep or swine, female sex hormone administration does not increase fat deposition.

I have already said that the female sex hormones have been administered in feed and pellet form beneath the skin and in the form of a sort of a semi-solid paste in chickens since about 1942. They have had widespread use. In cattle and in sheep, to the best of my knowledge, the first results of this sort were obtained with beef heifers at Purdue between 1948 and 1949, with beef steers at Purdue in 1950 and with feeder lambs at Purdue in 1949. This administration was done by means of pellets. Varying amounts of hormone pellets were implanted beneath the skin and the results were soon confirmed by the South Dakota experiment station, the Wisconsin experiment station, California, Ohio, Michigan, and Kansas.

The implantation of the female sex hormones also caused an increase in the rate of growth. It always resulted in an improvement in the efficiencies of feed utilization but, unfortunately, it was almost always accompanied by some recognizable change in the animal, such as mammary development.

Sometimes at high levels of hormone administration there was a reduction of nearly a full grade and in other cases, over a longer feeding period and with smaller levels of hormone administration, there was no recognizable reduction in carcass grade.

Since our original demonstration with pellets in 1948, there has been a tendency to administer lower and lower doses. At one time we were administering 120 milligrams once during the fattening period, which would last from 100 to 150 days or occasionally more.

The most recent work is that of the University of California. I have been told that, in large scale tests in feed lots in the western area, the single implantation of only 30 milligrams of diethylstilbestrol once during the fattening period, at the beginning, is producing very marked improvement in the rate of gain and feed efficiency with a minimum of effect upon the quality of the carcass.

In 1954 it was reported at the Iowa experiment station that cattle carcass evaluations had been fully as good where diethylstilbestrol had been included in the feed as they were where the carcass was produced without hormone administration. It was suggested, therefore, that when the female sex hormones were administered in the feed you got all of the advantages of hormone administration with none of the disadvantages.

"IF I COULD JUST REMEMBER the weight of meat per cubic foot, and what you do with πr^2 to get the volume of a cylinder, I'd certainly win this natural casings sausage weight guessing contest," may be the conclusion of the rapt young man. You can see from the way the lady is tapping her toe that she certainly has the right answer.



There is a tremendous amount of research in progress—research which is being conducted with all different kinds of cattle, different quality of cattle, different ages and weights of cattle, different systems of feeding, and all these results are not exactly the same.

This is an extremely complex problem and a great many of the experiment stations in the period from 1948 until 1954 were attempting, through field and other tests, to iron out all the problems, and trying to anticipate those which would occur in the field when widespread applications were made.

One of the reasons that I mentioned the widespread distribution of female sex hormones was that it is entirely possible, with one kind of a ration and under one set of feed lot conditions, to administer a certain level of hormone and have a large number of advantages and no recognizable disadvantages. However, it is entirely possible for someone else with the same kind of cattle to administer the same amount of hormone to them in their feed, plus the amount being consumed in the natural ration, and the results would be different.

During the past year there have been some conflicting results, and not everyone has received the same effects.

Let me try to summarize what there is by way of complete agreement on some of the problems which still remain.

The best research information available to date indicates that the administration of estrogenic substances, such as diethylstilbestrol, dienestrol and hexestrol, produces the following effects in cattle:

1. Increases rate of gain. I believe that any group of heifers or steers which are being fed a full feed for maximum growth and fattening will respond to female sex hormones, whether they are administered in the feed or whether they are planted beneath the skin. I believe that, if these cattle are on a certain quantity of basic ration per day, they will gain about 2 lbs. a day when the hormone is administered.

If protein is limited, if these cattle are being "roughed" in the winter, if they are cattle on the range and growing at a low rate, if the general quality of the ration being fed is one adapted essentially just to maintain the animals or maybe even in a negative plane of nutrition, you can

expect that the administration of hormones will make a poor system of feeding. If you are going to produce an increased rate of growth, you have to have the nutrients that are capable of producing growth. I have read an occasional article about the addition of hormones to poor quality ration making it a lot better. I would want to examine those results rather carefully myself.

2. The female sex hormones do improve feed efficiency. Here again there will be some differences, depending upon what kind of a ration is being fed, but the efficiency increase of 10 per cent is rather common and, occasionally, a great improvement in the feed efficiency appears. This has occurred in cattle and sheep of both sexes, including bulls or even lambs.

3. The administration of the female sex hormones does not increase fat deposition. I did not say that it decreases the fat deposition; I said that the administration of female sex hormones has not been shown to increase fat deposition.

Looking over quite a large amount of data, there are experiments in which carcass quality—which I presume was determined chiefly by conformation and by fat covering—has sometimes been maintained equal to that of controls, but I do not recall many instances of where there has been any improvement in carcass quality attributable to increased fat deposition.

This leads up to the next topic; the administration of the sex hormones does not improve carcass grade. That is the fourth point. I think that some of the early publicity released on this point did suggest that carcass quality would be improved. It is a little difficult to evaluate all of the experiments. In the current issue of the *Journal of Animal Science*, there are two or three reports on sheep. We have ourselves conducted quite a number of experiments on sheep, on both the hormone implanted lambs and on those which have been fed these sex hormones.

I believe that everybody agrees that with sheep there is a tendency for a reduction in carcass quality. In most cases this is only a fraction of a grade. However, with regard to sheep, I believe that most of us are in agreement that there is a slight decline in carcass grade based upon our present standard.

There also is reasonable agreement that what happens in sheep is an actual increase in muscular tissue. Why do the hormones increase muscular tissue and why don't



DR. DAMON CATRON of Iowa State College works from center of livestock meeting floor in diagramming and demonstrating data which are projected on a screen at the end of the room.



U.S. SENATOR Bourke B. Hickenlooper of Iowa (center), who spoke at the livestock session, chats with Aled Davies of the Institute and George D. Wilson of the American Meat Institute Foundation.

they increase fat deposition? The best answer that I can give to that is that probably the hormones make the animal feel a little bit younger than he is. I notice a number of knowing smiles out there in the audience, and I just wonder if some of you people actually think that hormones make you younger than you are. You must remember that, really, a man is not a great deal older than his hormones.

The sex hormones do seem to increase true growth and true growth is muscular and skeletal growth and fattening. When you begin to deposit fat, it is a sign that you are getting on.

With regard to the fattening of cattle, there are so many systems in that respect that, frankly, I wish that I had the exact answer to the effects upon carcass grade. All that I can say at the present time is that the data available to us indicate that you cannot expect any improvement in carcass grade. There have been a number of experiments in which there was no change in carcass grade, and there also have been some experiments in which a slight decrease in carcass grade was indicated in results.

Point number five is, are there any side effects? By this I mean, is there any method by which you can tell that animals have been treated with sex hormones? Here, again, there have been numerous reports that proper use of the sex hormones would not result in any recognizable changes.

The most constant side effect of the female sex hormones is an increase in teat length. I do not see how an increase in teat length is necessarily related to the carcass value, to the degree of fattening. We already have enough milk being produced by dairy cows and so we are not trying to get it from steers.

I have heard some rumors about how to tell hormone fed cattle. There is a story that goes about like this: Last spring a large cattle feeder, who had been using hormones and who was near a central market, decided to have a couple of buyers look at his cattle before he took them to market. The buyer drove up in his car, got out, looked over the fence and said, 'Well, I see that you have been using diethylstilbestrol.'

The feeder was kind of taken aback. As it turned out he had used it for 30 days and hadn't been using it for

at least 60 days. He replied, "Yes, I did feed them a little but how did you find out?"

The buyer replied, "Easy, I just looked at their middles."

I have looked at the middles of a lot of these cattle and, frankly, I don't believe that you can tell hormone treated cattle by looking at their middles. There might be other ways but this isn't one of them.

Another question that we were asked several times last year was as to whether any of the hormones came through in the fecal material and, if so, whether this was good or bad. You might look at that both ways for there is some evidence that the female sex hormones may cause plants to bloom, blossom and grow.

Then, too, there are some feeders who will allow hogs to follow cattle which may have been treated with these hormones. Sometimes these are animals which they intend to breed later. The question is, whether the hogs will pick up enough of this material to have any effect upon them. Some of you men may have been at our cattle day at Purdue last spring. We had a bunch of gilts that had been following cattle all winter. We did not allow the gilts to get any other source of feed. They had to depend for their complete livelihood upon the fecal droppings of the cattle.

The gilts showed definite mammary development. The vulvas were all swollen, and some of these animals looked like they were in heat all of the time. We took them away from the cattle and in about a month we began to breed them. To make a long story short, there is hormone activity in the fecal material but it will take quite a large amount of such activity to have any permanent effect upon them.

One thing a feeder has to understand. If these pigs start eating the hormone treated feed which is available to the cattle, then expect some pretty important things to happen to the pigs because pigs are far more sensitive to the sex hormones than are cattle.

The next thing is that these hormones were meant to be fed to market animals and not to feeding or breeding stock. We have known for over 25 years that the administration of female sex hormones to males causes the testicles to shrink and to become non-functional, and if a male gets enough female sex hormones it will cause him to be at least temporarily sterile.

Natural feedstuffs have been shown to have estrogenic activity, particularly legume pastures, silage and hay. This should be considered if hormones are administered to livestock. This may explain in part the variability in



SOME OF SPEAKERS at the scientific and operating session.

animal response in cases where hormones are administered.

Next year you are going to hear a great deal about the effects of hormones plus antibiotics. There are a great number of experiments in progress along this line. We have one completed and have two in progress. Some of the reports thus far have been that hormones plus antibiotics give a greater response in growth rate and feed efficiency than either alone.

Regardless of statistical analysis and quality control and all sorts of high-powered mathematics, we at Purdue definitely feel that any experiment ought to be repeated before you get too far out on a limb predicting results, and it should be repeated under a variety of field conditions.

As to the future, I believe that only time and additional information will obtain satisfactory answers to questions regarding the future of carcass grades and quality, shrinkage on live animals, shrinkage in carcasses, acceptability of meat to consumers, acceptability of by-products and the market price of live animals.

If you want to look way ahead to the future, then keep your ears open for something called the anabolic sciences. This means an increase in nitrogen deposition. This means increased proteins, increased muscular development. We want these substances without any sexual side effects. The female and male sex hormones are among the better anabolic substances that we have at the present time. However, I feel sure that in due time the chemist is going to give us some new substances. I do not have any idea as to what their nature is going to be. However, I am sure that these new substances will be of great value to the livestock industry.



SAUSAGE AND MERCHANDISING were explored under chairmanship of Carl Weisel by Dr. W. J. Shannon, John C. Milton, J. Russell Ives and Carl Thommen.

Live Hog Evaluation System Is Told

• Results in the pork section of the industry have been generally unsatisfactory in recent years. All of us have been concerned with the various segments of the business which have been responsible for this situation.

We have not been able to effect a satisfactory answer to the problem, but I am convinced that poor hog buying is at least a partial answer. It has been said for many years that "goods well bought are half sold." In the meat industry, this is particularly true because of the perishability of our products and the very highly competitive nature of our business.

Swift & Company installed, about two years ago, a hog buying system which we refer to as "Live Hog Evaluation." The basic principles are not new. All of us know that the practice of evaluating live beef animals has been in use for many, many years. The buyer looking at a pen of steers or heifers has at his disposal necessary information to enable him to determine with reasonable accuracy just what those particular animals should be worth in the carcass and his bidding price is made with this factor primarily in mind.

For years, in the hog business, we have pretty generally bought hogs as we did bananas, by the bunch. Certainly, all of us have known that individual carcasses and lots of hogs have varied in so far as their value to the business is concerned, but we have done a very poor job of translating the true value of the animals into terms of what we should actually pay for them on the hoof. Perhaps the most important factor in bringing us to a more practical realization of our problem has been the declining value of lard in proportion to hog values in recent years.

For five years prior to World War I, loose lard sold at approximately 132 per cent of the average price of hogs. In the five subsequent years, this ratio increased to 147 per cent due essentially to wartime demand. Since that time, there has been an almost progressive decrease in



V. FRANZ

the relative value of lard. At the present time, the price of lard is approximately 70 per cent of the average live hog price, the lowest of any year during the past 45. Vegetable fats have cut into the market. Consumers have expressed an increased preference for lean meat.

There can be no doubt that fat pork has cut considerably into the acceptance of and the demand for pork products, a demand which declined from 3.2 per cent in 1920 to 2 per cent in 1954 when expressed in terms of the percentage of the consumer dollar spent for pork.

The emphasis in recent years upon "meat type" hogs is an important element in procuring a basic reversal of this trend. Closer trimming of cuts has been successfully practiced by some members of the industry for years.

Because of the preponderance of opinion among consumers, retailers, packers, and producers, that fat has been a major deterrent to the consumption of pork, the AMI recently suggested that serious consideration be given by members to improving pork by removing more of the fat. This is economically sound since fat removed at the packer level is utilized better and at less expense since it largely eliminates retrimming by the retailer.

All this adds up to the necessity for our knowing more about what we are buying and what hogs are worth, expressed in terms of consumer acceptance, as well as the amount of money returned from each grade involved.

Naturally, we figure cut-out tests. We break down these tests into meat type, good, and fat type hogs. These correspond, of course, to the U. S. No. 1, U. S. No. 2, and U. S. No. 3 grades. The hog buyer is supplied with cut-out information daily, and it is his responsibility to try to buy hogs in line with cut-out values.

Unfortunately, even with this knowledge, we have not been able to effect the return to the business that we should. However, I am confident that we are far better off than we otherwise would be and that we have been successful in buying more of the acceptable weights and types of hogs because of our live hog evaluation system.

There are three major factors involved in good hog buying practice which must be kept in mind:

1.) YIELD: A buyer must take into account con-

LEFT: R. A. Rath appears surprised, and Oscar G. Mayer, somewhat pleased, over something Dr. W. J. Shannon has said. RIGHT: Neither L. E. Kahn nor F. W. Specht appear to be too down-hearted about meat industry prospects.



formation and finish and determine within his best judgment what a particular lot of hogs will yield when dressed. Generally speaking, the fatter hogs yield better than the average. Extent of the fill is another factor. If the buyer over-estimates the yield, we have higher costing hogs. If he under-estimates, the reverse would be true. The highly competitive nature of the business makes accuracy necessary.

We set up what we consider average or standard yields. These differ for various weights and classifications, depending on the season of the year. The actual yield of the lot is compared with the standard yield to determine whether and to what extent a yield advantage or disadvantage exists.

2.) **WEIGHTS:** The spread between prices of the various weights is well known to all of you, and I am sure you realize how much money can be lost by missing the weights of a drove of hogs by say 10 lbs. We must know the proper assortment within a drove and be able to evaluate properly, if we are to do a good buying job.

3.) **GRADES:** In the past, the first two factors mentioned: the yields and weights, have been given fairly consistent consideration by the buyers. The grade, however, as expressed in our terms today of meat type, good and fat types, was not recognized as such and applied in practice. It is imperative that we recognize these various grades for what they are worth and price each on its specific merits.

We have made some progress in this respect, but there is still a great deal to be done. It is not alone a question of merit buying because it is best from the viewpoint of the packer, but we must realize that it is distinctly in the interest of the producer from the long range viewpoint.

The "American" way has developed the highest standard of living ever achieved by man essentially because it provided incentive, an incentive to produce better goods, more goods at lower costs. Such progress has been possible only because of the greater reward returned those who provided these superior goods and services. It is, therefore, essential that hogs be bought on their merits.

The farmer who produces "meat type" hogs worth substantially more than "fat" hogs hardly can be expected to continue to produce them if he is penalized in the comparative price he receives at the market. Conversely, and this is most important, it is bad business to pay too much for fat type hogs. It is costly. It rewards the inefficient producer and encourages the production of the very hogs which have been responsible for loss of acceptance of pork in the eyes of the consumer.

If the pork business is to reverse this trend, we must translate the actual value of the product into the equivalent price for the hogs from which the product was produced. Incidentally, we do not use the word "premiums" or "discounts" in buying operations. We prefer the term "merit," and merit buying applies to all grades of hogs, whether they be lean or fat.

In actual practice, our live hog evaluation system works like this: Individual buyers must estimate the yield of each lot purchased. They also must estimate the number of hogs of the various weight ranges. In other words, they may buy a load of hogs averaging 220 lbs. but they must estimate exactly how many hogs of

the lot weigh 160/170, 170/180 and so on by 10-lb. breaks up to the top weight.

When hogs are killed, the dressed yield is figured on the basis of the warm weight less allowance for cooler shrink. This yield is compared with the standard yield. The buyers, therefore, know immediately whether their appraisal was correct. The advantage or disadvantage of the actual yield compared to the standard yield is computed.

Each carcass is weighed individually on our killing floor, and the actual yield of the total lot is used to convert the individual dressed weights back to live weight. There obviously is some inaccuracy in doing this because lighter weights generally yield less than the heavier. However, from an operating point of view, it is the most practical procedure to follow.

The individual live weights then are tabulated for every 10-lb. range and priced on the basis of the quoted market of each weight for the day purchased. The difference between actual purchase price and the total value so indicated is shown as the market profit or loss.

Tests on meat type hogs tell us how much per cwt. more they are worth than the average good hog, also how much less fat hogs are worth than good hogs. In other words, we determine the spread per cwt. in the values of meat type and fat type hogs of the same average weight. These values change from time to time, and we keep our buyers currently informed regarding these changes.

The buyer must show on his purchase record the estimated percentage of meat type, good, and fat type hogs in each lot. We apply the per cwt. advantage on the meat type and the per cwt. disadvantage on fat type hogs to the percentage of these hogs actually purchased and arrive at the grade margin. Obviously, if a buyer estimates 25 per cent meat type and only gets 10 per cent, it will reflect as a rather substantial loss and vice versa.

The final figure is a combination of the yield, weight and grade results. It is impractical for us to keep separate slaughtering reports on every lot of hogs purchased by each buyer. When lots from several buyers are combined for slaughter, the results are available only on a group basis.

However, we run tests on at least two individual lots bought by each of our buyers every week. These lots are selected at random and provide a consistent check on the buying performance of each buyer.

To give you a clearer picture, I should like to point out the difference which existed in two lots of hogs slaughtered several months ago. They were purchased the same day. In Lot 1 (see Table 1), we had 124 head averaging 213 lbs. live, costing \$18.00 per cwt., actual yield 68.68 per cent, equivalent \$26.20 per cwt. dressed. Table 1 appears on page 118.

You will observe that there were several hogs under and over the minimum and maximum weights estimated by the buyer. As a result, there was a disadvantage in the sort of 23¢ per cwt. The hogs yielded slightly better than standard, representing a yield advantage of 5¢ per cwt.

They actually graded 49 per cent meat type, 35 per cent good and 16 per cent fat. Applying what we considered to be the cutting advantage, 75¢ per cwt. on

meat type, 40¢ per cwt. disadvantage on fat type gave us an over-all advantage on the lot of 30¢ per cwt. for

TABLE 1: LOT 1—124 HEAD. MIDDLES, AVG. 213 LBS. LIVE. COST \$18.00 CWT. YIELD 68.68% = \$26.20 CWT. DRESSED COST.

Live Weight Range	Number	Est.	Actual	Wgt.	Market Price	Amount
170 lbs.	—	2	—	340	\$18.00	\$ 61.20
180 lbs.	—	3	—	540	18.00	97.20
190 lbs.	10	7	—	1,330	18.00	239.40
200 lbs.	23	21	—	4,200	18.00	756.00
210 lbs.	30	26	—	5,460	18.00	982.80
220 lbs.	30	31	—	6,820	18.00	1,227.60
230 lbs.	21	19	—	4,370	17.50	764.75
240 lbs.	10	12	—	2,880	17.00	489.60
250 lbs.	—	3	—	750	16.75	125.62
260 lbs.	—	—	—	—	—	—
270 lbs.	—	—	—	—	—	—
280 lbs.	—	—	—	—	—	—
290 lbs.	—	—	—	—	—	—
300 lbs.	—	—	—	—	—	—
124 Head	124 Head	26,690			\$17.77	\$4,744.17
Graded 49% Meat Type—Value	75c cwt. +	+.36 cwt. +				
35% Good	.40c cwt. —	-.06 cwt. —				
16% Fat	Average Lot	+.30 cwt. +				
Hogs actually cost 18.00, worth 17.77	—	.23 cwt. disadvantage				
Hogs actually yielded 68.68, standard yield 68.5	—	.05 cwt. advantage				
Hogs actually graded	—	.30 cwt. advantage				
Buying Advantage	—	.12 cwt. total				

grade. Combining the three factors, namely, weight, yield, and grade results gave us a buying advantage of 12¢ per cwt. on the lot in question.

In Lot 2 (see Table 2) we had 122 head, average

TABLE 2: LOT 2—122 HEAD. MIDDLES, AVG. 219 LBS. LIVE. COST \$18.00 CWT. YIELD 67.49% = \$26.67 CWT. DRESSED COST.

Live Weight Range	Number	Est.	Actual	Wgt.	Market Price	Amount
170 lbs.	—	2	—	340	\$18.00	\$ 61.20
180 lbs.	—	—	—	900	18.00	162.00
190 lbs.	11	16	—	3,040	18.00	547.20
200 lbs.	20	22	—	4,200	18.00	756.00
210 lbs.	20	17	—	3,570	18.00	642.60
220 lbs.	20	8	—	1,760	18.00	316.80
230 lbs.	20	14	—	3,220	17.50	563.50
240 lbs.	20	10	—	2,400	17.00	408.00
250 lbs.	10	11	—	2,750	16.75	460.62
260 lbs.	1	8	—	2,080	16.50	343.20
270 lbs.	1	8	—	2,080	16.50	343.20
280 lbs.	—	7	—	1,890	16.40	309.96
290 lbs.	—	1	—	290	16.10	46.69
300 lbs.	—	1	—	300	16.00	48.00
122 Head	122 Head	26,740			\$17.44	\$4,665.77
Graded 5% Meat Type—Value	.75c cwt. +	+.04 cwt. +				
10% Good	.40c cwt. —	-.34 cwt. —				
85% Fat	Average Lot	+.30 cwt. +				
Hogs actually cost \$18.00 cwt. worth \$17.44	—	.56 cwt. disadvantage				
Hogs actually yielded 67.49, standard yield 68.5	—	.27 cwt. disadvantage				
Hogs actually graded	—	.30 cwt. disadvantage				
Average Lot 1.13 cwt. disadvantage						

live weight 219 lbs., about the same as Lot 1; cost was identical.

Here again, there is a sizable sort or weight disadvantage. There are too many hogs under and over the weights estimated by the buyer. The disadvantage is 56¢ per cwt. The yield of 67.49 is substantially less than standard, representing a disadvantage of 27¢ per cwt. The lot graded only 5 per cent meat type hogs, 85 per cent fat type. By the same process of computation, the over-all disadvantage on grade was 30¢ per cwt. Adding the three factors together, there is a 56¢ per cwt. disadvantage in weight, 27¢ per cwt. disadvantage in yield, and 30¢ per cwt. disadvantage in grade, or an average disadvantage for the entire lot of \$1.13 per cwt.

In Table 3, note the comparison. It is obvious that the buyer of Lot 1 did a far better job than did the buyer of Lot 2.

TABLE 3

	Yield	Grade	Quote	Total
Lot 1	+05	+30	-23	+\$.12
Lot 2	-27	-30	-56	-1.13

This system is applied to all purchases of hogs whether bought on terminal market, direct, or through other buyers. In the case of hogs bought through order buyers, we do not procure estimates on yield and type. We do know, based on terminal market quotations, what the proper comparative paying price should be.

We, therefore, apply the same relative factors using our standard yield in comparison with the actual yield, the same weight comparisons, and give the lot the proper value adjustment for meat type and fat hogs. If a particular point is out of line, we have insisted that improvement be shown. We have in many cases stopped buying from particular points and from individual shippers if betterment was not secured.

At each of our plants, the man in charge of provisions works closely with the buyers, results are scrutinized daily, and the program is, of necessity, one of continuous follow-through and application. At larger markets where several buyers are involved, there develops quite a competitive spirit which we feel is beneficial.

In addition to this, we have recently begun to apply a cut-out factor to the live hog evaluation report. Obviously, a buyer could show up very well from a buying point of view, but in the last analysis, it is essential that we direct our buying efforts to the greatest practical extent upon the weights and types of hogs with the better cut-outs. In other words, if middles are cutting out substantially better than lights, assuming that our trade requirements can be modified, we attempt to buy more of the middles.

Daily cut-outs provide the basis for striking an average cut-out value on individual lots slaughtered. For example, to pose a simple illustration, if 50 per cent of a particular lot were middles cutting out at 25¢ per cwt. profit, 50 per cent were heavies cutting out at 25¢ per cwt. loss, the entire lot would break even.

Buyers, therefore, who are able to direct their activities toward getting hogs with better cut-outs, will have results showing up better in the final figure under our live hog evaluation system. This, we feel, is essential if optimum return is to be procured.

The system is not perfect. We have made some modifications and will make others as we proceed. There is no doubt in our minds that this buying system is helping us to a better end. Having said this, important as buying is both to us as meat packers and to the producer who expects to be and should be compensated in proportion to the merit characteristic of his hogs, it is just one phase of pork results.

We are still faced and shall continue to be faced with the endless task of constantly striving to improve our operating efficiency as well as our selling and distributing systems. A better buying job can easily be offset by poor practices in other ends of the business. Our success as an industry depends primarily on giving consumers better products and service for less money. They are the ultimate judges of what we do. Our course of action is dictated in the last analysis by their attitudes and what they do about them.

I hope that as an industry we can progressively contribute to the basic economy of the American farmer and consumer and in the process improve the very meager and unsatisfactory return which has been the experience of the pork business in recent years.

AMI SESSION

SCIENTIFIC & OPERATING

Electrostatic Smoking—Dr. M. C. Brockmann, director of research, Kingan Inc., Indianapolis.

The Use of Pure Culture Starters in the Manufacture of Summer Sausage—Dr. C. F. Niven, assistant director of research and education, American Meat Institute Foundation, Chicago.

Ionizing Radiation in the Meat Industry—Dr. Robert G. Tischer, director, food laboratories, Quartermaster Food and Container Institute for the Armed Forces, Chicago.

Antibiotics and Livestock Production—Dr. H. G. Luther, director of the agricultural research and development department, Chas. Pfizer & Co., Inc., Terre Haute, Ind.

Electrostatic Smoking Is Described



DR. BROCKMANN

• From the standpoints of both volume and profit, smoked meats are of major consideration to the packer. There is no need to discuss the operation of conventional type smokehouses nor the changes which occur in meat during processing therein.

It is convenient to think of a smokehouse as performing three basic functions, smoking, heating and drying. The material here presented deals largely with smoking although some consideration will be directed toward heating and drying.

While smoking is known to result in some preservative as well as antioxidative action, the meat packer is primarily concerned with the development of smoked flavor. A distinctive flavor together with a smoked appearance of the surface are established as essential characteristics of smoked meats. These properties cannot be defined objectively for, unfortunately, our knowledge of the chemistry of hardwood smoke is limited.

While phenolic materials are generally associated with a smoke flavor, there is little information on the origin or nature of the specific compounds involved. From the limited amount of work which has been reported concerning the factors influencing smoke deposition in the processing of meat and fish, there is little hope that the conventional process can be significantly shortened without sacrificing flavor.

In view of the necessity for heating and dehydrating many smoked products, packers appear to regard smoking itself as an incidental operation to be carried out concurrently with other smokehouse functions.

However, if consideration is given to the development of a truly continuous operation to replace the existing batch process, the time requirements for smoking become a potentially limiting factor, especially in the case of large items such as hams and bellies. The electrostatic deposition of smoke on meat products utilizes the same principle as has been employed for more than 40 years for the precipitation of dispersed solids from industrial stack gases. A number of patents dating back to 1922 have been granted on various electrostatic processes and devices for smoking of food products, primarily meat and fish. With few exceptions, the systems covered by patents are not suited to the high speed continuous processing of meat products.

Before I describe the essential design and operating features of a continuous commercial scale electrostatic unit, certain phases of our experimental program in the laboratory warrant attention. A small electrostatic smoking unit was set up in our pilot plant smokehouse. Power source for this unit was an old x-ray rectifier and transformer.

The first objective, after we were able to obtain an appreciable deposition, was to assure ourselves that the flavor imparted by electrostatic smoking is normal. Numerous tests have indicated the flavor to be indistinguishable from that resulting from conventional smoking methods.

The next phase of the laboratory program was directed toward establishing the design and operating characteristics which favor a high rate of smoke deposition. Attention is directed toward the operating characteristics of the electrostatic unit since these ultimately become the basis on which the commercial equipment is controlled to produce a desired level of smoke deposition.

To conserve time, this description will be based on a cross section diagram of the commercial unit, Figure 1. Save for size and a continuous conveyor, the commercial unit is essentially the same as the laboratory model. Smoke from a generator enters near the bottom of the

chamber through duct (13) and passes upward between plate and wire ionizer (6).

The ionizers, a more detailed description of which is given later, are suspended from rods attached to heavy duty insulators (5). Each bank of ionizers is connected

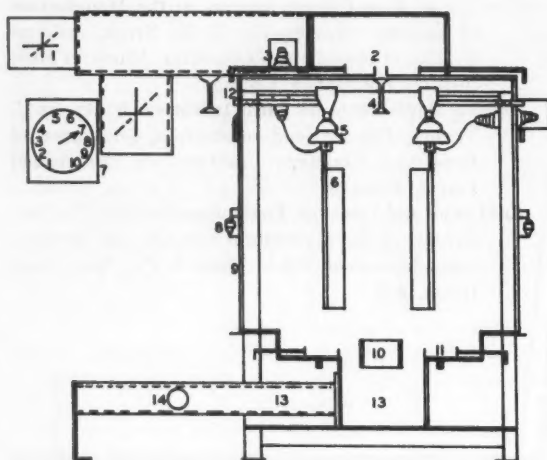


FIGURE 1: Cross section of smoking chamber. 1) Smoke exhaust duct louvers; 2) Smoke exhaust duct; 3) High voltage lead-in insulator; 4) Conveyor rail; 5) Insulators; 6) Ionizer; 7) Bailey smoke meter; 8) Micro safety switch; 9) Access doors; 10) Grease trough; 11) Smoke inlet louvers; 12) Ionizer slide bars; 13) Smoke inlet duct, and 14) Bolometer.

by means of an electric cable to a high voltage source located outside of the chamber. Provision is made (12) for moving the ionizers closer or farther from the central plane of the chamber. The product to be smoked is attached by means of a comb to a cable conveyor which travels on an I-beam track (4).

It is essential that the product be maintained at ground potential and equidistant from the ionizers. Smoke not deposited on the product is withdrawn through louvers

at the top of the chamber and thence to a smoke exhaust duct (2).

Figure 2 shows in more detail the design of the ionizing units which after considerable experimentation was found to be quite satisfactory. The ionizers are fabricated from stainless steel plates 36x36 in. At the top corners of each plate are hooks for hanging the ionizers on a horizontal rod.

The top and bottom of each plate is a bracket which supports a series of parallel vertical wires 3 in. apart in a plane 3 in. from the ionizer plate. Little or no advantage was found for ionizers having wires closer together than 3 in. and a distance of 3 to 3½ in. between the wires and their respective plate was observed to be optimal for smoke deposition.

Wires may be of copper, but .007 in. diameter tungsten wire is preferred because of its greater strength. Wires are held under a mild tension by a spring at each end. It is presumed that the wires provide most of the ionization of smoke; however, the plates serve to channel the smoke into the zone of the product and aid in repelling charged smoke particles in the direction of the sample.

Controlled experimentation demonstrated that the rate of smoke deposition increases as the voltage on the ionizers is increased. In the same manner, decreasing the distance between the ionizers and the sample increases the rate of smoke deposition. The operating limit for these variables must be such that an electric spark does not develop between the sample and the ionizer wires. As expected, smoke deposition bears a direct relationship to time.

The rate of deposition increases with smoke density as an exponential relationship. With the experimental equipment employed, the rate of smoke deposition reaches a maximum at a smoke velocity of 80 ft./min. With higher velocities, excessive deposition is observed on the metal parts at the top of the chamber.

With the preceding variables adjusted to optimal level, a bacon belly could be smoked to a normal flavor level in 2½ minutes. In the commercial unit, two of the above mentioned operating variables are usually used to control the degree of smoke deposition, ionizer voltage and exposure time; this latter variable is synonymous with conveyor speed. For products of different thickness, adjustments are made in the distance of the ionizers from the center plane of the chamber.

As a matter of convenience, an attempt is made to maintain a constant smoke density. This is done by a smoke density meter (7), see Fig. 1, which is activated by a bolometer (14) and light source located in the incoming smoke duct. During the period in which the output of the smoke generator is not stable, moderate variations in smoke density can be compensated by altering the voltage to the ionizers.

The continuous electrostatic unit is 10 ft. long and 4 ft. wide; external construction is galvanized plate. The total length of the ionizing zone is 9 ft., equivalent to three ionizing plates side by side. Near the bottom in the midplane is a trough (10) to collect anything which may drip from the product.

To provide for easy access, the side walls of the chamber are removable panels. As a safety feature, no panel can be removed without releasing a microswitch which

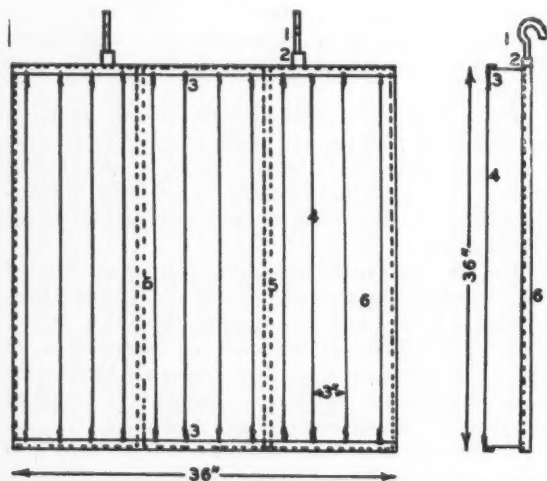


FIGURE 2: Ionizer assembly. In front view, 1) Ionizer hanger; 2) Hanger holder; 3) Tension springs. In side view, 4) Ionizer wire; 5) Back brace, and 6) Ionizer plate.

interrupts the high voltage to the ionizers. The high voltage source automatically cuts out whenever there is a sudden surge in power demand. The unit, by itself, is useful for smoking meat which is subsequently incorporated into comminuted products, such as Vienna sausage or luncheon meat. Encouraging results have been obtained by smoking cheese to be used in a smoked cheese spread.

Whenever the appearance of the surface of the smoked product is a consideration, a heating operation must follow electrostatic smoking in order to stabilize the deposited smoke. This problem has been met by adding an infrared heating chamber, a cross section of which is shown in Fig. 3. In the commercial installation, this chamber is about 10 ft. long and 3 ft. wide.

The sides and top are galvanized plate supported by an A-frame at the ends. An I-beam running centrally near the top of the heating section maintains the continuity of the conveyor cable. The bottom of the infrared chamber consists of removable stainless steel plates which slope into a trough running along one side of the section.

Near the upper edge of the bottom plates is a water spray for flushing into the trough anything which drips from the product. The heating section contains six rod-type infrared heating elements, three on each side. Each heating element resembles two hairpins with parallel bars 6 in. apart and extending 4.5 ft. forward and back-

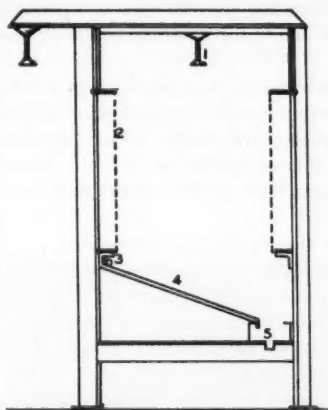


FIGURE 3: Cross section of infrared tunnel. 1) Conveyor rail; 2) Infrared panel; 3) Hot water line; 4) Drip pans, and 5) Grease trough.

ward from a waterproof junction box mounted in the middle of each side wall.

Thus each side wall carries six parallel rods spaced at vertical intervals of 6 in. The inner side walls of the heating section are polished aluminum plates which serve as reflectors for the infrared heaters. Each heating element draws 4.6 kw. The heat output of the section is controllable over a range of 0 to 100 per cent by a timing mechanism which operates on a 30 sec. cycle.

With the heating section operating in conjunction with the smoking chamber, the system is well suited for processing smoked products which do not require internal heating and smoked products which are heat processed elsewhere. Excellent results have been obtained in the smoking of boiled hams which are fully heat processed prior to introduction into the electrostatic chamber. The electrostatic system has found a substantial application in the smoking of hams and picnics prior to canning.

In order to increase the capacity of the equipment, a



FIGURE 4: Production of smoked hams for canning.

triple comb is used which holds six 3-lb. hams. Hams are cured, boned, trimmed and cut to approximate weight according to usual plant procedure. As may be seen in Fig. 4, one operator, after he has gained experience, is able to impale the hams on the comb, hang the comb on the conveyor and remove the smoked hams from the return conveyor.

In the processing of hams, a conveyor speed of 2.5 to 3 ft. per minute is used. Ionizer potentials range between 25,000 and 35,000 volts and the ionizer wires are moved 16 in. apart so that no portion of the ham comes close enough to the ionizer wire to produce an arc.

While the heat treatment in the infrared section provides sufficient heat on the surface to set the smoke, the added heat, after equilibration throughout the meat mass, raises the overall temperature of the meat by less than 5° F. Processing loss amounts to no more than 0.5 per cent of the cured meat entering the system.

From the standpoint of microbiology, the electrostatic smoking system has a distinct advantage. In contrast to a conventional smokehouse which to some extent functions as an incubator, the electrostatic process permits smoking to a desired level so quickly and at such a low temperature that no change in bacterial population is evident.

A major part of the smoked meats produced by most packers requires heating to a definite internal temperature as well as dehydration by a prescribed percentage. In order that electrostatic smoking attain maximum utility in a packing establishment, it is necessary to develop a continuous operation for processing items such as smoked hams and bacon bellies. Bacon was chosen as the experimental product primarily because of its dimensional characteristics.

Preliminary experiments involving the use of high temperature air, elevated humidity and increased air velocity indicated a minimum time of 90 minutes is required to develop an internal temperature of 120° F. in an 8-10 lb. belly. Larger bellies require considerably longer. With intense infrared heating, the temperature

of an 8-10 lb. belly can be brought to an internal temperature of 120° F. in about 22 minutes.

Under such conditions, bellies cured by an injection procedure decreased about 7 per cent in weight. Preliminary tests indicated that complete heat processing following electrostatic smoking markedly reduced smoke flavor. Normal smoke flavor was retained, however, if the bellies received the major portion of their infrared processing prior to electrostatic smoking followed by a short infrared treatment to stabilize the smoke. Extensive tests involved flavor, color, color stability, appearance of slices, frying characteristics, and resistance to microbial and oxidative deterioration.

The commercial unit for the continuous production of bacon by radiant heating and electrostatic smoking consists of six infrared sections plus the electrostatic smoking chamber. Five infrared sections precede the smoking chamber and one follows it.

The heating sections are identical in design with the infrared unit previously described. These units form a tunnel 70 ft. long through which product is conveyed by a cable conveyor. An overall concept of the continuous heating-smoking system for bacon is shown by Figure 5.

Skinned bellies, cured according to standard plant procedure, are combed and hung on the conveyor at the loading station just outside the first of the series of five infrared sections. The speed of the conveyor ranges from 2.6 ft./min. for 8-10 lb. bellies down to 1.4 ft./min. for 16-18 lb. bellies. Since the bellies hang 1 ft. apart on the conveyor, this is equivalent to a throughput of 1,400-1,500 lbs./hr. for all sizes of bellies up to 18 lbs.

In two of the six heating sections, the infrared units directed toward the fat side are not used because there is need for less heat on the fat side of the belly and because of the susceptibility of this side to overheating. All of the remaining infrared units are operated at 90 or 100 per cent of capacity. In the smoking chamber, the ionizer wires are about 4 in. from the surface of the belly.

An ionizer voltage of 30,000 volts is used for bellies up to 14 lbs.; this is reduced to 25,000 for bellies between 14 and 18 lbs. During processing, the bellies reach an internal temperature of 115 to 125° F. and show an average weight loss of approximately 7 per cent. This

loss combined with loss occurring between injection and processing and loss incurred during chilling, tempering and molding is more than adequate to meet the MIB requirements.

After passing through the system, the bellies remain on the conveyor for return to the loading station. At this point, they are transferred from the conveyor to a rack truck by the operator. Note that one operator handles both the loading and the unloading of the conveyor.

Extensive studies indicate that sliced bacon prepared from continuous process bellies is virtually indistinguishable from sliced bacon prepared by the conventional process. Many tons of continuous process bacon have been sliced, packaged as premium bacon and distributed through normal channels. There has been no evidence that retailers or ultimate consumers recognize the product as different from that to which they are accustomed.

To the meat packer, however, bacon prepared by infrared heating presents several problems. The appearance of the unsliced bacon is somewhat different from that of the conventional product. There may be a difference in the texture of the fat side. Slicing yields, while frequently equal to conventionally processed bellies, tend to be erratic. There is some evidence that a lower temperature and more careful handling at the time of slicing will improve the yield picture. Furthermore, it is probable that the infrared heating process does not provide an adequate margin of safety for odd size bellies within a given weight class.

Short, unusually thick bellies may come through the process without attaining adequate internal temperature or dehydration. Experience with bellies, which are relatively constant in thickness, points to a more severe problem if bone-in hams were to be continuously heat processed under infrared.

On the other side of the picture, the continuous processing of bellies offers several attractive advantages. From the standpoint of the packer, it can be shown that the handling cost per 100 lbs. of bacon is approximately one-half as much with the continuous process as with conventional batch smokehouses.

Also, in contrast to a smokehouse which requires a

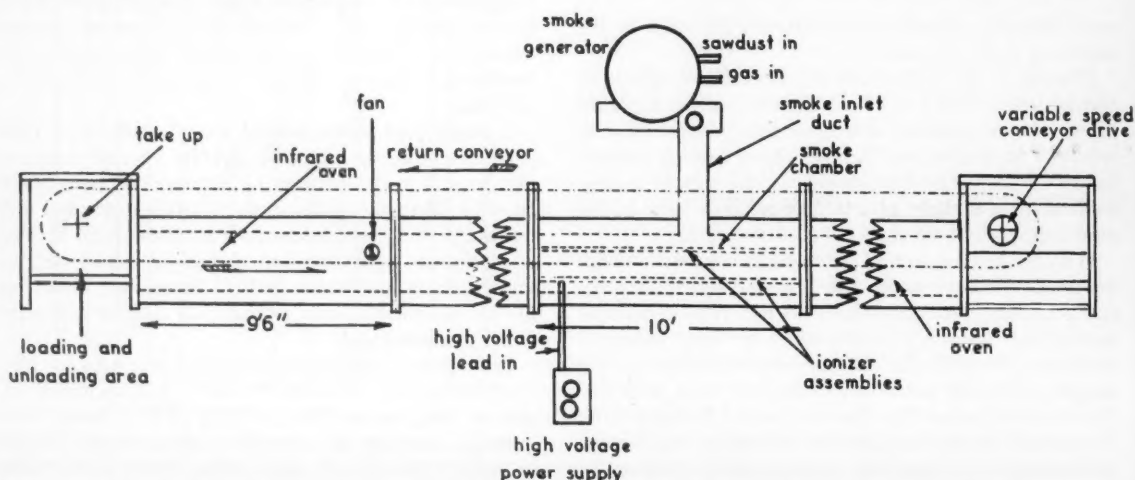


FIGURE 5: OVERALL CONCEPT OF THE CONTINUOUS HEATING-SMOKING SYSTEM FOR BACON.

fixed load for most efficient processing, the continuous operation is thoroughly flexible inasmuch as it requires no fixed number of bellies. Moreover, the capital expenditure required for the continuous system is substantially less than for conventional smokehouses of equivalent capacity. In addition, the continuous system carries several potential advantages which can be observed but which we have not, as yet, been able to evaluate thoroughly.

For example, any fat which drips from the bellies prior to entering the smoking chamber can be easily recovered as an edible product. By electrostatic deposition, it is possible to attain a far greater range of smoke flavor than is practical with batch smokehouses. Since heat processing is complete within such a short time, it is bacteriologically feasible to prepare smoked meats without added salt.

Unfortunately, it is not possible in the time available to present a comprehensive survey of our work on the continuous system itself or of our experience with the processing of smoked meats. All the evidence to date supports the conclusion that meat products can be quickly smoked by the electrostatic process. The smoke flavor imparted by the electrostatic process is indistinguishable from that produced by conventional smoking. The electrostatic process, according to our experimental and operating experience, is readily adaptable to the continuous smoking of meat products.

For products which do not require heating to a definite temperature at the time of smoking, continuous smoking can be recommended without reservation. With products, such as bacon, which require a heating to a prescribed temperature, the continuous process presents several real advantages as well as some unresolved problems. The negative aspects, however, are associated with the continuous heating system, not the electrostatic smoking process.



ALTHOUGH HIS BACK is turned, this can only be Chris Finkbeiner (or a near double) telling an Arkansas anecdote to three friends in the lobby.

Summer Sausage Starter Cultures Useful



DR. NIVEN

- Fermentation by microorganisms plays an indispensable role in the diets and food habits of the world's human population. In addition to our alcoholic beverages, microorganisms are essential in the preparation of our more popular foods, such as most of our breads, the various classes of cheese, ranging from cottage to limburger, the fermented milk drinks, and many fermented vegetables such as pickles, sauerkraut and olives.

Although unwittingly, the primary purpose of fermented foods by earlier man, dating before Biblical times, was preservation of the foods without refrigeration. Today we emphasize increased palatability of such foods although their high stability yet cannot be overlooked.

In addition to palatability, the texture of many of the foods is improved by fermentation. Also, we must recognize the strides taken by our modern, scientific world in employing microorganisms for the fortification of our foods with several of the B vitamins.

The meat industry is no exception in employing microorganisms to prepare a variety of meat foods. Various types of sausage, such as thuringer, cervelat, Lebanon, bologna, the salamis, and the dry and semi-dry summer sausage, are such examples of fermented meat foods which constitute an important part of our diet.

These fermented sausage represent a significant percentage of the volume of sausage consumed the world over. The bacterial fermentation which takes place in these sausage is directly responsible for the tangy flavor inherent in these foods. These sausage specialties promise to gain in prominence in our diet.

Most fermented foods have yielded to controlled fermentation, specifically, by the identification of the responsible microorganisms and their deliberate addition in pure culture to the respective foods to yield uniformly the desired results. The dairy and cheese industries have especially capitalized on these scientific developments.

Unfortunately, the sausage industry has not yet been able to employ successfully pure culture starters for the fermented sausage. However, significant strides have been made in this direction. Today, chance contamination of the appropriate bacteria is still being relied upon generally.

Traditionally, the fermented sausage have been prepared by using a straight nitrate cure to the chopped meat, to which is added the appropriate spicing formula and either corn or cane sugar. Under such conditions, two important bacteria-induced changes must occur, namely, 1) bacterial reduction of the nitrate to nitrite for the production of the desired color, and 2) fermentation of the added sugar to produce the desired flavor.

These two important changes require the presence of two different groups of microorganisms. One bacterial culture which could accomplish both these necessary changes would be a rarity in nature.

Under such conditions, excessive nitrate reduction

might retard or inhibit the sugar fermentation, and, conversely, prompt and excessive acid production from the sugar may inhibit nitrate reduction. It then becomes evident that a delicate balance exists in the microbial population of fermented sausage. No wonder failures are common.

Some common defects noted in these fermented sausage are: 1) lack of cured color development in the product; 2) softening due to lack of acid production or to the excessive growth of proteolytic varieties of bacteria; 3) gassiness due to the excessive growth of gas producing bacteria, and 4) lack of desired tangy flavor.

The idea of employing pure culture starters for fermented sausage is not new. Jensen and Paddock (1940) pioneered this field and obtained a patent for such a process in which a number of lactic acid bacteria were employed, especially several *Lactobacillus* species. These investigators used a straight nitrate cure which apparently necessitated the chance contamination of the sausage emulsion with nitrate reducing bacteria to achieve color fixation.

Conversely, Niinivaara (1955) has reported the successful use of nitrate-reducing starter culture (*Micrococcus aurantiacus*) to insure prompt color fixation in summer sausage. In this instance, apparently it was necessary to rely upon chance contamination with fermenting bacteria to achieve the desired tangy flavor.

It would appear that the sausage industry in the United States has gradually changed to the use of a mixed nitrate-nitrite cure in the manufacture of summer sausage. This practice has generally proved successful and eliminates the necessity of the growth of nitrate reducing bacteria in the sausage mix. Only a fermentative type of bacterium is then required for the development of the tangy flavor.

What are the requisites for a successful sausage starter culture involved in tangy flavor development?

1. It must be capable of growing vigorously in the sausage. In other words, it must be tolerant to the added salt and other curing agents. Many of the dairy starter cultures do not fulfill this requirement.

2. It must be capable of growing anaerobically. With

the exception of a fraction of an inch near the surface, the sausage is completely devoid of oxygen shortly after it is stuffed.

3. It must be a moderately active fermenter of the added sugar for production of the desired quantity of acid and accompanying tangy flavor. Some bacteria produce too much acid for acceptable palatability while many others would not achieve sufficient fermentation.

4. It must be a homofermentative culture. In other words, the major fermentation product should be lactic acid with little or no gas production.

5. No undesirable odors or flavors should be produced as the result of its growth and metabolism.

6. It must be non-proteolytic in order to avoid softening of the sausage.

7. It must have a reasonably wide temperature range for growth, preferably from about 50° F. to 110° F., in order to grow vigorously under the many smoking schedules practiced in the manufacture of the numerous varieties of fermented sausage.

8. Obviously, it must be harmless to human health.

The fulfillment of all these requirements eliminates the vast majority of the bacteria that exist in nature. Only one group of bacteria, namely, the lactic acid bacteria, would be expected to have representatives that possess this combination of characteristics.

Among the lactic acid bacteria, there exists a little known group of microorganisms that are invaluable in the successful manufacture of brined, fermented cucumber pickles. They occur in virtually all vegetable fermentations, such as sauerkraut and silage. They were first recognized as a beer spoilage microorganism because of their ability to grow in unpasteurized beer with the development of turbidity. We have observed these bacteria as a natural contaminant in various kinds of meat foods during the past several years.

Although there are several varieties of this group of microorganisms which resulted in several different names being prepared for them in the literature, the bacteriologist now regards them as one species, *Pediococcus cerevisiae* (Pederson, 1949). Peculiarly enough, this species appears to fit all the requirements for a successful



MEMBERS OF the capacity audience emerging from the sausage and merchandising session lose no time in discussing ways and means of profiting from the several presentations. The NP cameraman records some of the faces.

starter culture for use in producing summer sausage.

In the Foundation laboratories we have been interested in exploring the use of starter cultures in summer sausage. Recently we have been able to conduct research along these lines. For these experiments we have employed salt tolerant strains of *Pediococcus cerevisiae*. It has been noted that these bacteria grow rapidly in the sausage emulsion as they are subjected to the usual "cold" smoke.

In comparison to the control uninoculated sausage, the results have been most gratifying. Excellent flavor develops in the inoculated sausage which is uniform from one batch to another. In comparison, the control sausage often developed off flavors which could be best described in terms borrowed from the cheese industry as "unclean."

Perhaps the most striking contrast between the inoculated and control sausage was in their firmness. The inoculated sausage invariably became much firmer after 12 to 16 hours in the smokehouse. The difference in firmness also was evident in the finished sausage.

Subsequent work demonstrated that the three- to four-day holding period of the emulsion prior to stuffing could be eliminated when it was inoculated with the *Pediococcus* starter culture. Furthermore, the smoking period could be shortened from three days to two days. Consequently, a finished sausage could be made within 48 hours after the original trimmings had been chopped.

In our experiments, the starter culture has been sprinkled or sprayed uniformly onto the emulsion as it was being mixed. This would constitute the only additional step to that now followed in the manufacture of summer sausage. In most instances the bacteria were centrifuged from a broth and then resuspended in a small quantity of distilled water before adding to the mix. The quantity added varied from 0.1 to 2.0 per cent (bacteria from 0.1 to 2.0 pints of culture per 100 lbs. of sausage mix).

The starter culture can be successfully freeze-dried and maintained in a dry, powder form indefinitely. Although somewhat costly, this method of maintaining the starter culture may prove to be the most practical. Milk is not a satisfactory medium for the starter culture.

We anticipate that milk can be nutritionally fortified, or else some other satisfactory medium will be devised so that the culture can be added directly to the sausage mix, thus eliminating the necessity of centrifuging or freeze-drying the culture.

In our experiments, a cold smoke without ultimately cooking the sausage was practiced. The smokehouse temperature was maintained at approximately 85-95° F. at 90-95 per cent relative humidity for the first 46 hours, followed by a gradual increase in smokehouse temperature to 120° F. over a two-hour period.

At this stage the sausage could be considered a finished semi-dry product. Additional drying, accompanied by improvement and mellowing of flavor, would have to be accomplished in the holding room in the usual manner.

Thus, it would seem that the *Pediococcus* culture has several distinct advantages over the conventional dependence upon chance contaminants.

1. A shorter time is required. The four-day holding period for emulsion can be eliminated and the smoke period may be shortened.

2. The quality of the product would be expected to be more uniform from one batch to another.

G. B. THORNE, vice-president of Wilson & Co., presides at livestock session in the Red Lacquer room.



3. We feel that freedom from failures, such as softening, gassiness and poor color, would be assured. Top quality meat ingredients could be employed, accompanied by good sanitation practices, and yet the required fermentation would be accomplished promptly.

4. There would be an assurance against food poisoning or other harmful bacteria growing in the sausage either during or after manufacture. It must be admitted, however, that such occurrences are relatively rare in fermented sausage as they are now processed.

It is possible that the *Pediococcus cerevisiae* cultures employed in this investigation are not the only starter cultures that can be employed successfully in summer sausage. Time will tell whether other cultures will prove to be superior. However, the use of starter cultures would seem to have so many inherent advantages over reliance upon chance contaminants that their ultimate, widespread use in the industry appears inescapable. There is no reason why such cultures cannot be used in all of the wide variety of fermented sausage now being manufactured.

Contingent upon B.A.I. approval, we believe that the use of *Pediococcus cerevisiae* starter cultures is now ready for field trials to prove their worth in the summer sausage industry. At the moment there is no adequate source for usable quantities of these cultures, but we believe that, if they prove successful, convenient sources can be established rather promptly so that they can be obtained as readily as dairy starter cultures. We cannot predict the cost of such starter cultures, but we anticipate that it will not be excessive.



J. G. Myers of Modern Maid Food Products pays serious attention to the emphatic remarks of the conventioneer on the left as he talks to his seated friends.

Radiation Processing Tests Weighed

• Atomic age development has given the meat industry a new and as yet largely untried processing tool to work with experimentally. This tool is the radiation processing of meat products.

Radiation can, of course, be applied to any commodity with differing results in many cases. There are three main types of sources of radiation energy for processing. These are pure isotopes, reactor fuel elements and machine sources.

We are interested in all these sources as potential processing tools because they all can be used to destroy microbial life without the use of heat. In some cases, there appears to be a considerable advantage in terms of penetration because radioactive emanation can enter a meat product of normal consumer size in relatively short periods of time, differing from heat exchange methods where often a considerable amount of time is involved in the same procedure.

Radioactive isotopes, of which there are many, may be characterized by the isotope Co⁶⁰. Radioactive cobalt is the pure metal which has been activated by exposing it in an atomic pile to change it to the radioactive form. Following this treatment the radioactivity decreases rapidly. After each 5.3-year period, the activity, measured in curies is reduced by 50 per cent. Cobalt or other isotopes may be used for processing meats merely by providing an appropriate geometric situation in which the product to be irradiated is surrounded as much as possible by the radioactive isotope. During the period of processing, the product is shot through with gamma rays which kill bacteria, yeast and mold and make other changes in the product.

Fuel elements differ from pure isotopes in that they are a part of the reactor operation and because fuel elements are discharged from the reactor periodically as part of the normal operation. Each fuel element contains a large number of individual radioactive isotopes which are separated chemically for a variety of purposes. However, prior to the time when the separation may be made, the fuel elements must be allowed to cool both thermally and radioactively.

During this cooling off period, both beta and gamma rays are given off by the fuel rod and may be used for irradiating meat products. Depending upon location, time in the reactor and many other factors, a fuel element may be very highly radioactive. Being a waste product, reactor fuel elements ultimately may be less expensive for a food processor to use than would be pure isotopes. This question, however, has not been fully settled. With pure isotopes and with fuel elements, beta and/or gamma rays are produced. The gamma rays are particularly useful because of their high penetrating characteristics which are approximately 12 in. in water as compared with a small fraction of an inch for beta radiation and practically no penetration distance at all for the alpha type of radiation.



DR. TISCHER

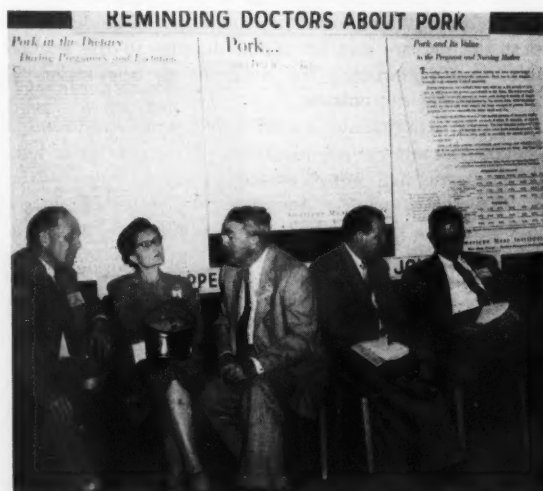
A number of machines are available for producing high speed electrons which also may be used for processing foods. These machines contain an electron source and an accelerating mechanism. Electrons generated by the electron source usually are sent through the accelerating mechanism to produce high speed electron projectiles which are discharged through a thin window in the end of the machine. This beam of electrons can be modified somewhat in direction and intensity by electrical means.

This source is used to bombard thin slices of food products for purposes similar to those for which isotopes in fuel elements are used. In this case, the chief limitation in adaptability appears to be in the penetration properties of the electron where only about 1/4 in. of a standard food item can be penetrated with certainty.

When the food product is irradiated, the alpha particles will bounce off the outside of the product while the betas will penetrate a fraction of an inch. Gamma rays may penetrate to a depth of 12 in. or in some cases will be powerful enough to go entirely through the product and be absorbed by some other absorber. Beta or gamma rays passing into food cause the ionization of water and other chemical entities contained in the food product. This is the reason they are called ionizing radiations.

Our chief interest in the effect of ionizing radiations rests with their ability to kill microbial populations and to change other chemical entities within the food product. When these tiny projectiles enter the food product, they may by chance strike a bacterium. If they strike a sensitive portion of the bacterium, it is likely that this unit will not again be able to reproduce itself and is, therefore, technically dead. The same occurrence may take place with yeast and mold.

In such products as meat and cheese, color changes have been noted after irradiation. These color changes are probably the result of similar effects of atomic bombardment. When the projectile strikes a color or flavor molecule, it is very likely that portions of this molecule are destroyed or broken off from the rest of the chemical



THE IMPORTANCE OF pork in the diet may or may not be the subject under discussion—but whatever it is, the topic seems to be an absorbing one for these conventioners.

entity. When this sort of change occurs in any chemical, corresponding changes are noted in the physical and chemical properties. In color and flavor molecules, these chemical changes result in noticeable differences in color and changes in flavor.

Since we tend to view the original color and flavor of food as highly desirable, any change which takes place is consequently viewed as degradative. Examples of this are the graying of strawberries upon irradiation, the change from yellow to orange in processed cheese and loss of characteristic color in meat sausage products.

In some of the work involving meat products, changes in texture have been noticed. In the higher grades of meat, of course, this is not a desirable change since the meat already is sufficiently tender. In the low grades, however, this change may well be desirable if it makes more acceptably tender cuts out of normally tough ones.

To sum up these remarks on characteristics of data in gamma rays, we may presume that the effects of radiation in killing bacteria, inactivating enzymes and preventing undesirable chemical changes in food products during processing and storage are essentially gains from radiation since the absence of bacteria and enzymes go far toward preventing ordinary spoilage while the absence of chemical changes of certain types might prevent such things as certain oxidative changes.

If we may presume that color, flavor and texture of originally available products are high, then these changes must be viewed as losses due to radiation and it is the intention of the project to work on methods of prevention of color, flavor and texture losses.

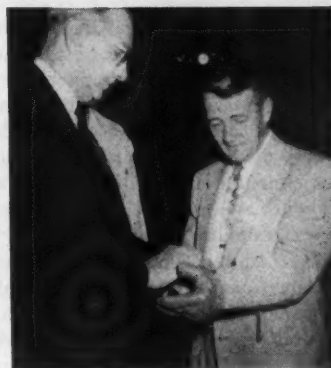
Perhaps a better view of this situation may be obtained by considering several specific meat products upon which some attention has been placed in the radiation processing program. One such example is the field of retail cuts. Original thoughts on this score when our project was started were to the effect that we would attempt to can meat, that is sterilize it completely, for delivery to the Armed Forces. Since then a great deal of thinking has gone into this subject and appears to take the form of an orderly retreat from sterilization leading to consideration of surface treatment or pasteurization.

Some workers apparently are able to prepare irradiated retail cuts of beef which have a very acceptable flavor while others, using similar processes, find their product none too acceptable. If we assume that the possibility of preparing completely sterile retail cuts is not high, then the use of surface treatments might hold great promise because of the fact that the low doses of irradiation necessary for surface treatment are not likely to cause major changes in the flavor, or the color or the texture of the product.

Dr. H. R. Kraybill, director of the American Meat Institute Foundation, has underway a considerable amount of work with his scientists which is designed to discover some of the attributes of the pasteurization treatment for retail cuts. Even though the irradiation process appears to be usable for pasteurization, there are left a number of other considerations which must be taken into account before such a procedure could be adopted commercially.

We must make certain that color and texture changes do not occur upon storage which are not apparent directly after irradiation and which might make the process un-

IT PAYS TO BE SAFE, says Martin Cernetisch, director of safety for John Morrell & Co., Ottumwa, as he fastens a mesh arm guard for John Thurman, safety director of Oscar Mayer & Co. at Madison, Wis.



desirable. These problems already are common to normal processing with certain meat products where color and flavor losses are apparent upon storage at the retail outlet.

Another common loss is that of liquid in the marketing procedure. If it should occur that any considerable amount of liquid is set free by the irradiation process, it might then be necessary either to modify or abandon individual item processes because of this factor alone.

Considering that all these factors which normally are assessed against non-irradiation processes probably also apply to radiation, it seems apparent at once that a great deal of work must be done in deciding what kind of machinery should be used, where it will be placed and how it will be operated before the procedure for pasteurization of retail cuts can be viewed as a success.

Another example of a meat product which has been irradiated is bacon. Brief experiments with this commodity have indicated that bacon may be sterilized by radiation with no apparent loss of quality in the fried product. Since one normally does not eat raw bacon, there is no really good opportunity to assess any quality losses which might be apparent in the raw product. If off-flavors do exist in the raw product, these have been dissipated by the time it is prepared for consumption.

If we can attempt to visualize the type of equipment which might be necessary for the radiation sterilization of bacon, we might imagine that it would require a medium-sized radiation source located in the plant somewhere in the slicing and packaging line. This unit would require shielding, careful attention with regard to personnel safety and a certain amount of upkeep depending upon whether isotopes, fuel elements or machine sources were used.

With a product like sliced bacon in the package, it would seem likely that a machine source could be used with profit since the package is relatively thin. This would mean that the source could be turned on and off at will and that there would be no replacement problems as there would be for isotopic sources.

Tests with sausage add to our list of examples of irradiated meat products. In some of these products the color losses commonly noted in conjunction with storage in light appear to take place also as a result in part of radiation. The opportunity has not yet presented itself for exhaustive storage tests but it seems apparent that the color problem will not be substantially improved if a radiation process is used.

Another point which has borne no emphasis as yet is

the water holding capacity of some of the components of sausage products. It is conceivable in view of the texture changes which have already been mentioned in some meat products that the water holding capacities of sausage components may be changed by irradiation. It is at once obvious that this sort of change could be important either negatively or positively as the case may be. We will have to await with interest further work along these lines to assess the value of this effect if it exists.

Ham represents an entirely different kind of cured product from bacon in that the geometry of it is vastly different. Where bacon is thin, ham is thick. Where bacon is regular, ham is irregular. A point of similarity is, or course, the need for refrigeration of both products. It is conceivable that the irradiation treatment of ham prior to canning or in the can might reduce the requirements for refrigerating the finished product. If the canned product could be irradiated to sterility, the need for refrigeration might disappear entirely.

The source necessary for this kind of operation probably would be an isotope or a fuel element because of the rather great thicknesses to be treated. This dictates the use of gamma radiation to be economical for this kind of test. It is likely that a unit of relatively high intensity could be set up in a plant, again with appropriate shielding and personnel safety precautions, to irradiate reasonably large numbers of cans of canned ham as they go through the line subsequent to sealing. In view of the fact that heat is often desirable in the processing of a ham, it might be best to consider combinations of heat and irradiation. In this event the process might be operated in such fashion that both the heat and the irradiation would be applied prior to placing the product in the can, or perhaps followed by a light irradiation dose after the product is canned to sterilize the surface.

Bread, cheese, brown-and-serve rolls, sausage, bacon, hamburger, green beans, peaches and a number of other items have been subjected to radiation processes with some degree of success. At this point these commodities appear to fall in two classes, those which survive irradiation without great change and those which do not.

For those which survive irradiation without great change, the task remaining is to work out the storage tests and discover whether there are other concomitant changes which are as important in the final process. For those products which show considerable degradation on irradiation, work is continuing along lines involving removal of oxygen, the addition of inert gases, the addition of chemicals, chemical additives, new packages, etc.

When all the technological difficulties are solved for a given commodity, the ultimate use of the process for that commodity still will depend upon certain cost factors which are common to every process. In this case the cost of the source of the treatment and the cost of operation are large unknown factors. These costs probably can be estimated best by using processes on commodities which have shown a measure of success. If these processes can then be used on a pilot plant scale to discover more about the costs of isotopic sources and operation expense, it then should be possible to decide whether the radiation process can successfully compete with other processes already in existence. Whether this new and promising tool has a large or small effect on operations in meat remains for further determination.

Antibiotics for Meat and Livestock



J. G. LUTHER

● In the animal production phase of the meat industry, antibiotics have made revolutionary contributions. Their application to the processing phase is still undergoing development but promises to make an equally important contribution to greater efficiency in operations and meat distribution.

Livestock production has been augmented through application of antibiotics in three ways:

(1) The antibiotics are used widely in veterinary medicine in the treatment of flagrant infectious disease. This is because of their recognized high effectiveness against disease organisms.

(2) The antibiotics are fed routinely to millions of animals at relatively low levels because they bring about important increases in rate of gain,—on the order of 10 per cent or more in poultry and pigs, and increases in feed efficiency of 5 per cent or better even on feeds properly balanced in vitamins and other nutrients.

(3) When included in feeds at somewhat higher levels, antibiotics have headed off latent disease, overcome active disease, reduced early mortality from ill-defined causes in baby chicks, poult and pigs and, according to latest findings, helped maintain egg production when it drops from the imposition of stresses such as extreme hot weather, vaccination, chilling, shipping and latent disease.

In the field of food processing, antibiotics have been under study to retard bacterial spoilage of many products including vegetables, fish, and poultry. For meats, in particular, new processes have been devised to introduce antibiotics into meat before slaughter, thus retarding deep spoilage.

This review will omit reference to the more strictly medical uses of antibiotics but will cover salient points in their use in feeding of livestock, with special reference to carcass quality and applications in meat processing.

GROWTH PROMOTANTS: It is only a little more than five years ago that the feeding of antibiotics to promote growth of meat animals was still in an experimental stage. Now their inclusion in mixed feeds for this purpose is a widespread practice. It still is a mystery how such small amounts of these agents exert such profound effects on growth and feed efficiency despite diligent efforts by many researchers to discover the cause. Millions of animals have been raised over the past five years on feeds containing minute quantities of antibiotics—quantities ranging from 2 up to 40 or 50 grams per ton, depending upon the type of antibiotic and the species of animal. The extra "oomph" for better and more efficient growth thus provided has improved the income of livestock raisers and furnished larger supplies of stock for processors.

There is considerable difference among antibiotics in their applicability to different species. Broad-spectrum antibiotics, such as terramycin and aureomycin, are very effective for poultry, swine and ruminants. Penicillin

provides excellent results with poultry, is quantitatively less effective for swine and is of no benefit to ruminants. Bacitracin is less effective than penicillin for poultry, about as effective for swine, and is effective also for calves.

Table 1 shows the results of feeding various antibiotics to chickens at low "nutritional" levels, and Table 2 the results with turkeys.

TABLE 1: EFFECT OF ANTIBIOTICS ON CHICK GROWTH
(as per cent of growth without antibiotics)

	Grams Antibiotic per Tons Feed							
	0.6	1	1.2	2	3	5	6	10
Penicillin	114		117		122		121	
Terramycin		108.5		111		112		114
Aureomycin				109		113		115
Bacitracin				108.5		116		116

Feed efficiencies are enhanced up to 10 per cent, with average advantages about 5 per cent.

TABLE 2: EFFECT OF ANTIBIOTICS ON POULT GROWTH
(as per cent of growth without Antibiotic)

	Grams Antibiotic per ton Feed					
	0.6	1.2	3	5	6	10
Procaine Penicillin		128	130		127	
Terramycin	108		111	119		123
Aureomycin	112		110	123		118
Bacitracin	111		109	123		128

According to Stokstad (1954), the majority of the observed growth increases in turkeys as a result of antibiotic feeding either at four or eight weeks fall between 10 per cent and 30 per cent. Feed efficiency is enhanced from 5 per cent to 10 per cent.

Stokstad states also that growth responses of 7 to 11

per cent have been observed in goslings fed penicillin and with aureomycin, penicillin, streptomycin and terramycin. In one reported study with ducks there was no growth increase from the addition of antibiotics. Limited trials with pheasants, according to Heuser (1951), showed "a larger increase in weight than with chickens," while ducks "showed a smaller gain" as a result of antibiotic feeding.

For swine, comparative antibiotic feeding tests (166 observations from 95 reports) can be summarized in the following indexes (non-use equals 100): aureomycin, 116.5; terramycin, 116.7, and penicillin, 114.4. Under conditions of stress imposed by inadequate diet or digestive disorders, responses by pigs to antibiotic feeding have been much higher.

According to Braude, Kon and Porter (1953), in over 80 per cent of antibiotic trials with swine, enhancement of growth has been accompanied by a 3 per cent to 5 per cent increase in feed efficiency.

Antibiotics are especially useful for increasing the growth of baby pigs fed artificial milk. Baby pigs are very susceptible to digestive disorders and it has been suggested that the profound effectiveness for them of antibiotics may be due to a disease preventive action. In the United States several proprietary milk substitutes containing antibiotics are available and there is a growing practice of raising baby pigs on such diets after only a few weeks on the sow. Use of antibiotics in swine feeds has resulted also in more uniform animals. Those that otherwise would be small and runty make more nearly average gains and death losses are reduced.

Effect on Carcass Quality. Considerable study has been given both in this country and abroad to the possible effect of antibiotic feeding upon carcass quality of swine. Dr. Hjelmar Clausen, of Denmark, has been especially concerned with this subject. Dr. Clausen has

TABLE 3: INFLUENCE OF PENICILLIN, TERRAMYCIN, AUREOMYCIN AND AUROFAC ON THE QUALITY OF PIG CARCASSES

Growing period 20-90 Kg live weight. Restricted feeding.

(From Clausen, H.: International Symposium on Antibiotics in Agriculture)

	Group A = no antibiotics		Group B = 10 mg antibiotics per F.U.							
			Pro. Pen.		Terramycin		Aureomycin		Aurofac ¹	
	A	B	A	B	A	B	A	B	A	B
No. of Pigs	722	722	145	145	73	73	53	53		
F.U. per pig daily ²	2.05	2.06	2.02	2.04	2.01	2.02	2.01	2.00		
Daily weight gain, g	583	610	576	621	569	593	573	587		
F.U. per kg live weight gain ²	3.52	3.38	3.51	3.29	3.53	3.41	3.50	3.40		
Dressing Percentage	73.0	73.2	73.1	73.6	73.4	73.5	73.5	73.7		
Body length, cm	94.5	94.5	93.8	93.6	94.2	93.9	94.4	93.9		
Thickness of back fat, cm ³	3.34	3.36	3.41	3.39	3.43	3.37	3.44	3.41		
Weight of leaf fat, kg	1.76	1.75	1.78	1.75	1.79	1.73	1.77	1.73		
Thickness of streak	3.21	3.22	3.31	3.32	3.34	3.34	3.33	3.37		
Scores (0-15) for:										
Amount of lean meat	12.5	12.5	12.6	12.6	12.6	12.8	12.6	12.7		
Colour of lean meat	12.3	12.4	12.1	12.3	12.0	12.4	12.1	12.4		
Size of shoulders	11.9	11.9	12.0	11.9	12.2	12.2	12.2	12.4		
Size of hams	12.2	12.2	12.1	12.1	12.5	12.5	12.4	12.7		
Distribution of back fat	12.7	12.7	12.7	12.5	12.7	12.7	12.6	12.7		
Fineness of head, bone, skin	13.0	12.9	13.0	13.0	12.9	12.9	12.8	12.9		
Bacon type	12.0	12.0	11.9	11.9	12.2	12.3	12.2	12.2		
Firmness of back fat	13.1	13.1	12.8	12.7	12.8	12.8	12.9	13.0		
Iodine number (back fat)	59.8	59.6	59.8	60.3	57.2	57.6	57.2	56.6		
% pigs in grade I (lean)	83	83	84	81	83	84	82	78		
% pigs in grade II (too fat)	15	14	14	18	14	14	15	18		
% pigs in grade III (much too fat)	2	3	2	1	3	2	3	4		

¹Aurofac is given in amounts corresponding to 10 mg pure aureomycin per F.U.

²1 F.U. is the feeding value of 1 kg barley.

³Corrected for an equal number of sows and barrows in each group and for 67.0 kg slaughter weight and 94.0 cm body length.

As the experiments with terramycin, aureomycin and aurofac did not comprise so many different combinations of feed as did those with penicillin, the table should not be used for comparisons between the effects of the different antibiotics.

presented detailed reports of his findings on carcass quality both at the European Symposium on Antibiotics and New Growth Factors in Animal Nutrition in May and at the recent Washington International Symposium on Antibiotics in Agriculture. His studies in Denmark have shown that method of feeding considerably affects carcass quality. In many of the Scandinavian countries restricted feeding is practiced in order to produce leaner carcasses. Dr. Clausen has separated his findings according to type of feeding.

Table 3 shows the effect of various antibiotics when supplementing the rations of pigs under restricted feeding. It will be noticed that the antibiotics exert no effect upon thickness of back fat or of streak, or on the total grade score. In addition to standard observations, physical separation studies were conducted and results indicate that there is no change in composition of carcass, so that antibiotic supplementation brings about a true enhancement of meat production.

In studies on rations of varying protein content with restricted feeding, Clausen's investigations have indicated that decreased carcass grades are obtained at the lower levels. The addition of antibiotic does not decrease the thicker back fat found when protein levels are insufficient.

In all of the studies on restricted feeding, there is a definite tendency toward increased dressing percentage when antibiotics were fed. There apparently is no effect on dressing percentage when the basal rations consisted of grain plus sugar beet or grain plus potatoes. However, the major effect on dressing per cent was with

been conducted in artificial rumens and in the living animals equipped with a rumen fistula having a removable plastic cap.

A comparative study of eight antibiotics conducted by Pfizer workers (Hardie et al 1953-54) using an artificial rumen, showed that chloramphenicol and polymyxin B sulfate have practically no effect upon cellulose digestion by rumen organisms. Bacitracin, dihydrostreptomycin, oxytetracycline and chlortetracycline have a moderate effect; however penicillin and carbomycin have a strong effect in depressing cellulose digestion.

Table 5: Influence of Antibiotics on Chemical Composition of Meat, and Water Content of Back Fat (Restricted Feeding)

(Clausen, H.: International Symposium on Antibiotics in Agriculture)

	No Anti- biotics 8	Pro- caine Peni- cillin 7	Terra- mycin 8	Aureo- mycin 8	Auro- fac 7
No. of pigs					
Eye muscle (longissimus dorsi):					
% Dry matter	26.5	27.1	26.8	26.0	27.1
% Crude fat	1.9	2.4	2.4	1.9	2.5
% Fat-free dry matter	24.7	24.8	24.4	24.2	24.7
pH	5.48	5.49	5.48	5.49	5.38
Tender loin (psoas m. major):					
% Dry matter	24.8	24.9	24.7	25.0	24.9
% Crude fat	1.9 ¹	2.7	2.1	2.1	2.3
% Fat-free dry matter	22.5	22.2	22.7	22.9	22.7
pH	6.06	6.04	5.85	5.93	5.79
% Water in back-fat	8.75	8.33	8.20	9.40	9.60

¹One sample not analyzed for crude fat (lost)

All antibiotics: 10 mg per F.U.

Table 4: Terramycin in Rations at Different Protein Levels Influence on Carcass (Restricted Feeding)¹

(Clausen, H.: International Symposium on Antibiotics in Agriculture)

Protein level:	Very low	Low	Optimal
Kg skim milk per pig daily	0.5	1.0	1.5
Protein concentrate ²	40	75	110
Terramycin per F.U., mg.	0	0	0
No. of pigs	10	10	10
Dressing percentage	73.6	73.7	73.2
Thickness of back-fat, cm ³	3.94	3.82	3.62
Thickness of streak, cm	3.55	3.43	3.40
Weight of leaf fat, kg.	2.10	1.79	1.46

¹The experiment just finished. Daily gain and feed consumption not yet evaluated.

²2/3 extr. soya bean meal 1/3 meat and bone meal per pig daily.

³Corrected for an equal number of sows and barrows in each group and for 67.0 kg carcass weight and 94.0 cm body length.

pigs fed grain without sugar beet or potatoes. In the grain-fed animals, the dressing percentage of those fed antibiotics was significantly greater (5 per cent level) than in grain-fed without antibiotic.

In swine fed according to appetite the literature is somewhat confusing. There have been some reports indicating an increase of fat in such animals fed antibiotic.

Calf Rumen Function: The feeding of antibiotics to ruminants has raised the question of possible influence upon rumen function, inasmuch as digestion of cellulose and other breakdown processes of ingested food depend upon the action of rumen micro-organisms. Many investigators have conducted extensive studies, involving microscopic examination of rumen contents and biochemical determinations of ability of rumen contents to break down cellulose. These cellulolytic studies have

Studies on terramycin (Hardie et al, 1955) in calves have shown that there is no significant effect of the antibiotic on development of rumination in calves regardless of the time at which it is introduced into the rumen. These findings are important in view of the enhancement of growth and feed efficiency which has been obtained in calves.

Growth and Feed Efficiency: Feeding trials of various antibiotics have been conducted with calves by a number of agricultural experiment stations and by commercial laboratories [Cason et al. (1951), McKay et al. (1953), Kesler and Knodt (1952), Loosli et al. (1950), Hardie et al. (1955, in press.)]

A recent comparative study by Owen et al. (1955) largely substantiates results of earlier work on the overall action of antibiotics and their relative effectiveness. Their conclusions in part are as follows:

"Mean body weight gains over a 12-week period as per cent of the mean gains of the controls were: Experiment I, terramycin, 155 per cent; aureomycin, 151 per cent; penicillin, 86 per cent; Experiment II, terramycin, 135 per cent; arsonic acid, 128 per cent; bacitracin, 126 per cent; chloromycetin, 111 per cent. The treatments that stimulated growth also improved efficiency of feed utilization. The most rapidly gaining groups also attained greater height at the withers and appeared somewhat superior in condition and hair coat at the conclusion of the experiment; however these differences were not marked. . .

"... Efficiency of feed utilization was improved sig-

nificantly ($P=0.01$) in Experiment I by aureomycin and terramycin as compared with the penicillin and control groups. Comparison of all treated groups in Experiment II with the controls also suggested ($P=0.09$) an improvement in efficiency of feed utilization."

In many calf experiments less scours have been reported in the animals receiving an antibiotic.

Cattle Rumen Function: Terramycin was added directly to the feed at levels of 50 and 200 parts per million (Luther et al. 1955). A transient initial depressing effect on cellulose digestion was noted at the 200 ppm level in feed; none at 50 ppm. Normal cellulose digesting capacity was attained after 2 or 3 days during which antibiotic administration continued.

Effect on Weight Gain and Feed Efficiency—Antibiotic supplementation at low nutritional levels in beef cattle has been investigated extensively in the past two years. In the case of terramycin, cumulative data, some of which is summarized in Table 6, show that this supplement produces an average increase in both gain and feed efficiency of about 10 per cent and there is no effect upon carcass quality.

These improvements have been noted on rations ranging in calorie content from 300 to 1000 per lb., approximately. Range of terramycin intake was from 60 to 150 mg. per animal per day.

These findings of the Texas and Indiana Agricultural Experiment Stations and of Chas. Pfizer are paralleled by several recent commercial field trials on which data are as yet not sufficiently completed for inclusion in the summary.

ANTIBIOTICS AND ESTROGENS: One of the newest developments in connection with antibiotics as growth stimulants is synergism with the synthetic estrogen diethylstilbestrol.

The use of sex hormones and related compounds as stimulants accelerating growth and deposition of fat in poultry and livestock has been under investigation for some years. The availability of relatively low-cost orally active synthetic estrogen-like materials such as diethylstilbestrol (stilbestrol) has stimulated research in this field. Implantation of pellets of stilbestrol in chickens (so-called "chemical caponizing") has become an es-

tablished practice and dienestrol diacetate is available for feed use in this species.

In the case of cattle and sheep there has been much work on the effect of implanting stilbestrol and other hormones. In one such experiment conducted by Pfizer all treated groups showed significantly better gains than the controls. An economic analysis of the experiment showed that the oral stilbestrol treatment gave the highest return.

Many experiments from several universities which have been reported in the past two years support the efficiency and economy of feeding stilbestrol and this is becoming an accepted practice in the livestock industry.

As has been developed earlier, terramycin exerts a significant effect at relatively low levels in enhancing rate of growth and efficiency of feed conversion by beef

TABLE 7: ADVANTAGES OF TERRAMYCIN AND DIETHYLSTILBESTROL IN COMBINATION

	O	STILBESTROL	TM	TM STILBESTROL
Gain-lb./day				
15.3B-2	2.25	2.47	2.47	2.94
15.3B-3	2.03	2.46	2.38	2.55
Growth Index				
15.3B-2	100	110	110	131
15.3B-3	100	121	117	126
		(115 avg.)	(113 avg.)	(128 avg.)
Lb. Feed/lb. Gain				
15.3B-2	11.25	9.84	10.78	9.50
15.3B-3	12.61	10.6	11.0	10.16
F.E. Index				
15.3B-2	100	114	104	124
15.3B-3	100	119	116	124
		(117 avg.)	(110 avg.)	(124 avg.)
Av. Carcass Grading				
15.3B-2	9.95	9.10	9.55	9.55
15.3B-3	8.72	8.84	9.00	9.35
Carcass Index				
15.3B-2	100	91	96	96
15.3B-3	100	101	103	107
		(96 avg.)	(99 avg.)	(102 avg.)

cattle. Therefore, we at Pfizer sought to determine whether the action of terramycin would be supplemental to that of stilbestrol.

One experiment of this type is summarized in Table 7. The combination of terramycin and stilbestrol brought better growth and feed efficiency than either alone.

The combined use of terramycin and diethylstilbestrol

TABLE 6: EFFECT OF TERRAMYCIN IN RATIONS FOR BEEF CATTLE LEVEL OF SUPPLEMENTATION 60-150 MG/DAY

Trial	No. Animals	Growth			Feed Efficiency			Carcass Gr. Score		Dressing per cent	
		O	TM	Growth Index	O	TM	F.E. Index	O	TM	O	TM
Pfizer, 106	11	2.07	2.38	115	11.08	9.58	115	10.82	10.74	57.4	59.6
Pfizer, 125	24	2.14	2.31	108	10.67	10.01	107	10.33	10.58	62.2	62.6
Pfizer, 137	20	2.25	2.47	110	11.25	10.78	104	9.95	9.55	62.6	62.7
Pfizer, 139	12	2.03	2.38	117	12.61	11.00	112	8.72	9.00	55.5	55.4
Pfizer, 129	18	1.26	1.44	114	13.95	12.31	113	...	...	...	...
Texas (1712)	7	2.18	2.21	102	13.51	12.40	109	9.40	9.40	61.8	62.4
Texas (1955)	5	2.56	2.71	106	10.13	9.47	107	8.40	8.30	60.0	60.2
Texas (1955)	5	2.21	2.48	114	11.70	10.41	111	8.40	8.60	62.5	63.0
Pfizer, 130*	10	1.36	1.67	112	2.93	2.75	106	...	...	...	...
Avg.	12.4	2.01	2.23	111	11.86	10.75	109	9.43	9.45	60.3	60.8

*130—Dairy calf trial—Feed efficiency omitted from average

in the feeding of beef cattle is permitted by the Food and Drug Administration and is now a commercial practice.

HIGH-LEVEL FEEDING OF ANTIBIOTICS: The usual levels of antibiotics for improvement of growth and feed efficiency are from 2 to 10 grams per ton of feed. Somewhat higher levels, approximately 25 grams per ton, are used in starting rations for calves, and still higher levels (50 grams per ton) for baby pigs. Levels above 50 grams per ton ranging up to 200 gm. are designated as "high level". Today, more and more attention is being given to these higher levels for intermittent use under special conditions, such as:

- (1) To control early mortality from ill-defined causes in chicks, poults and baby pigs.
- (2) To combat active disease.
- (3) To combat stresses, such as heat, cold, vaccination, shipping, etc.—stress situations which are perhaps complicated in many cases by latent disease. This application of antibiotics has been investigated chiefly with laying hens.

Chicks: Many raisers of chickens and turkeys are plagued by high death losses during the early life of the birds. The feeding of terramycin at high levels during this critical period is effective in reducing these losses, the cause of which is often unknown.

Poults: Water and feed treatments were used by Peterson (1952) to combat high mortality among poults from the third to the seventh day after hatching.

Many growers feed a high level of terramycin for the first week or two of life of chicks and poults as an effective and economically justifiable form of insurance.

Swine: "Tail-end" pigs—those which do not gain normally under accepted feeding practices and subnormal in health and vigor—are markedly benefited by high-level antibiotic feeding. Beeson and Conrad (1955) in a comparison of bacitracin, penicillin, aureomycin and terramycin at 100 gm. per ton of feed, found that aureomycin and terramycin brought about a significant increase in rate of gain in retarded pigs. Bacitracin gave no response as compared with control pigs, and penicillin gave an intermediate response. Aureomycin and terramycin gave good protection against scours. The authors regard this as evidence justifying the feeding of high levels of aureomycin or terramycin at 100 gm. per ton from weaning to 100 lb. weight, and then the usual lower "nutritional" levels to marketing as a practical way to stimulate the rate of gain of pigs.

These recommendations are in line with those of Catron, at Iowa State College, who has suggested 100 gm. of antibiotic per ton of feed for baby pigs in order to control diarrhea and to ensure improved health.

Meade, (1955) at the Nebraska Agricultural Experiment Station, has reported recently on tests with high levels of several antibiotics conducted over the past five years. The addition of 50, 75 or 100 gm. of aureomycin or terramycin to a ton of ration caused increases of 37 per cent to 40 per cent in average daily gain of growing-fattening pigs for an experimental period of 91 days. Lesser increases in average daily gain resulted from the addition of 10 gm. per ton of each of the antibiotics. According to Dr. Meade, the added cost of antibiotics at the higher level is not justified in terms of feed saved per unit of gain; however, the pigs fed the higher levels

were ready for market 10 to 21 days earlier than pigs on the basal diet, and the advantages of reduced risk, less labor cost and clearing of the premises for the next pig crop must be considered, he said.

Calves: The major use of high-level antibiotics in ruminants is to combat infectious diarrhea in young calves. Terramycin in such case is recommended at 100 gm. per ton of feed. Doses on this order of magnitude were utilized by Kafka (1951) in the control of white scours in calves. Two hundred milligrams of terramycin orally each day for three days brought satisfactory recovery. One hundred or 200 milligrams given once with the first or second feeding was sufficient for prophylaxis.

Control of Active Disease: The control of disease by medication given in feed is now an established practice. Administration of drugs in feeds saves time and labor, especially when large groups of animals are to be treated. It is natural and logical, therefore, that antibiotics should be given in the feed for the prevention and control of certain specific diseases as well as for protection against mortality and illness from undiagnosed causes—what may conveniently be termed the "general disease level".

Chronic respiratory disease of poultry is also called air sac infection. Certain antibiotics in feed or drinking water have been found effective in the control of this disease in that they maintain feed consumption and weight gain, or, in the case of laying birds, they prevent drastic falling off in egg production.

Blue comb, also called mud fever and non-specific enteritis, is a disease of sudden onset. It is accompanied by a marked drop in feed consumption, a darkening of the head, noticeable especially in turkeys, diarrhea and death. Essentially, blue comb affects the intestinal tract and the kidneys.

Peterson and Hymas (1951) describe the successful use of terramycin in the control of a sudden outbreak of blue comb in poults. After 48 hours on feed containing 100 ppm. of terramycin, plus water containing 5 ppm., deaths ceased. Overall mortality in this flock was only 5 per cent as compared with average mortality of about 50 per cent in untreated flocks.

Oral terramycin has shown some promise in the prevention of shipping fever. Results obtained in three large trials are summarized in Table 8 which shows that, among the animals which received a prophylactic regimen, much fewer subsequently needed treatment.

TABLE 8: PREVENTIVE USE OF TERRAMYCIN IN SHIPPING FEVER

Trial No.	No. Animals	Pct. Later Requiring Treatment	
		Controls	100 ppm TM 5 days before ship.
1	18,000	12	2
2	9,800	9	3
3	6,800	12	1.6

The safeness for use at high levels of terramycin has been established by extensive feeding tests in which levels as high as 2,000 and 3,500 gm. per ton have been fed without undesirable effects.

In the case of terramycin (oxytetracycline) 100 gm./ton, residual antibiotic activity is detected only in the kidney and fecal matter of poultry. At 200 gm./ton residual activity is detected in the large intestine, liver, kidney and fecal matter of poultry and intestine and

kidney of swine. Only at continuous feeding levels of 1,000 gm. per ton, an extremely high level, is residual activity detected in all tested tissues.

Residual terramycin disappears quickly from the tissues of swine and chickens, even when fed at highest levels.

According to Durbin et al. (1953-54) aureomycin can be found in lean flesh and liver of a considerable portion (40 per cent) of chickens fed 50-100 ppm. This activity is lost on cooking. This antibiotic also passes into the egg, but could not be found in 19 of 20 boiled eggs laid by hens on a ration containing 200 ppm.

ANTIBIOTICS IN PRESERVATION OF MEAT: Within recent years increasing attention has been given to the application of antibiotics in the preservation of foods. As this audience well knows, despite extensive refrigeration facilities, there is great need for adjuvants to slow bacterial spoilage of meat. Our entire system of meat distribution would be less cumbersome and waste would be reduced if carcasses and large cuts could be made more resistant to internal spoilage. Less refrigeration would be necessary and the hanging period might be reduced if it could be conducted at a higher temperature. There is the possibility of qualitative improvement in flavor, juiciness and tenderness if it were not necessary to chill meat immediately after killing of the animals, thus slowing the action of autolyzing enzymes.

Methods of rendering meat more resistant to internal spoilage could change radically for the better the diets of groups of people in regions where transportation and refrigeration facilities are limited. In such areas, extending the keeping qualities of meat would permit much more use of this nutritionally valuable food, with much less waste in distribution.

The studies of Deatherage et al. (1953a) at Ohio State University, have shown differences among the antibiotics in ability to retard spoilage in meat. Penicillin, streptomycin and bacitracin exerted little or no effect, whereas the broad-spectrum antibiotics, chloromycetin, oxytetracycline and chlortetracycline, were active.

Deatherage et al. (1953b) have described methods for infusing meats with a saline solution containing antibiotics. In one process, the antibiotic is added to cuts of meat by injecting the solution through needles. In another process, the animal is bled by cutting the jugular vein, and a cannula is inserted and one blood volume of a solution containing 3 gm. of antibiotic is forced through the circulatory system and then drained out. This process requires about 15 minutes.

Workers at Pfizer Agricultural Research Unit have de-

vised another process which effects distribution of the antibiotic throughout the tissues by using the animal's own circulatory system while it is still alive. In this process, the antibiotic is given by intraperitoneal injection, and is carried by blood and lymph to the most remote portions of the body, being distributed through all the soft tissues. The application of this method to lambs, cattle and pigs was described by Pfizer investigators in a series of papers presented before the recent Third International Symposium on Antibiotics held in Washington, D. C. The highlights of this research are condensed here.

Preliminary studies were conducted with lambs which were given intraperitoneal injections at the level of 6 mg. of antibiotic per pound of body weight. It was found that these injections could be made efficiently by untrained personnel after proper instruction. In this test the highest tissue level was obtained two hours after injection, the shortest time-lapse before taking samples.

The values tapered off with time, observations at 23 hours post-injection continuing to show appreciable amounts. Table 9 shows graphically the amounts in blood and lean meat. It appeared from these lean meat and blood levels that the time of slaughter is not highly critical, and that any time from one to four hours after injection should be satisfactory in order to achieve highest concentrations within the carcass. Table 10 shows the per cent retention of the antibiotic after 10 days.

TABLE 10: STABILITY OF OTC IN LAMB TISSUES
(Intraperitoneal Injection)

Animal No.	LEG			LIVER		
	Original mcg/gm	After 10 days mcg/gm	% Retained	Original mcg/gm	After 10 days mcg/gm	% Retained
1	0.78	0.8	102	4.8	3.0	63
2	1.4	0.65	46	2.3	2.1	91
3	0.97	0.75	77	6.8	5.1	75
4	1.8	1.9	105	8.7	5.25	60
5	4.1	5.7	139	41	38	93
6	3.1	3.5	145	23	21	92
7	6.0	5.7	95	90	62	69
8	<0.25	<0.25	—	0.28	<0.25	—
9	<0.25	<0.25	—	<0.25	<0.25	—
Average 101				Average 78		

The intraperitoneal injection of oxytetracycline was then tested on cattle in Cuba where refrigeration often is inadequate and where the climate hastens deterioration of meat. Arrangements were made through the Ministers of Commerce and Agriculture of the Republic of Cuba and with the cooperation of a large slaughter house. Only bulls of about 1,000 lb. weight were available at the time and since there were no chutes at hand, the animals were tied to a strong fence and held in

TABLE 9: OXYTETRACYCLINE CONTENT OF LAMB CARCASSES INTRAPERITONEAL INJECTION, 6 Mg. per pound body weight

Animal No. & OTC Source	Hours Post-Inj.	Tissue Content — mcg./gm.				Tissue Content — mcg./gm.			
		Heart	Chop	Leg	Kidney	Liver	Fat	Blood	
1 HC1	23	1.2	1.8	0.78	5.1	4.8	0.5	0.72	
2 Q	23	1.9	0.88	1.4	12.5	2.3	0.5	0.70	
3 HC1	11	1.1	1.2	0.97	8.0	6.8	0.5	0.84	
4 Q	11	0.63	2.0	1.8	15.0	8.7	1.1	1.4	
5 HC1	4	5.1	3.9	4.1	—*	41	1.25	7.5	
6 Q	4	3.2	2.6	3.1	33.0	23	1.25	4.6	
7 HC1	2	6.8	7.6	6.0	65.0	90	2.45	7.0	
8 Q	2	<0.25	<0.25	<0.25	0.26	0.28	<1.25	<1.25	
9 (Control)	—	<0.25	<0.25	<0.25	<0.25	<0.25	<0.5	<0.25	

* HC1 = hydrochloride Q = quaternary complex of oxytetracycline

* Animal No. 5 had only one kidney and this was on the other side which was left in the freezer locker.

place by pressing a swinging gate to their right side. For these animals, 10-gauge needles four or five inches long were used.

Tissue samples were taken one hour after injection and assay results are shown in Table 11.

TABLE 11: OXYTETRACYCLINE CONTENT OF BEEF TISSUE FOLLOWING INTRAPERITONEAL INJECTION

Animal	Treatment	OTC Activity		OTC in mcg./gm.	
		Injected		Kidney	Liver
No. 1	OTCQ*	6 Gm.		38	51
No. 2	OTCQ	3 Gm.		28	31
No. 3	OTCQ	1.5 Gm.		6	9
No. 4	OTCQ	3 Gm.		13	13
No. 5	OCT HCl	6 Gm.		16	18
No. 6	OCT HCl	3 Gm.		11	16
No. 7	None	Control		—	—

*OTCQ = oxytetracycline quaternary complex
OCT HCl = oxytetracycline hydrochloride

Antibiotic levels obtained with oxytetracycline quaternary ammonium complex (OTCQ) were satisfactory, but somewhat lower than would have been expected from the lamb trials. Levels obtained with oxytetracycline hydrochloride (OCT HCl) were much below expectations. Moreover, a staining of the parietal peritoneum was noticed. It appeared that much of the antibiotic was not absorbed and had become strongly bound to the peritoneum, but this was believed due to high mineral content of the water used for diluting the antibiotic. This was the only instance of staining. It was not noticed in any work with sheep or hogs.

Hindquarters of six treated animals and of one control were hung at room temperature for two days. Day-time temperatures were 32° to 35° C and relative humidity was apparently high. Both treated and control quarters darkened appreciably. The control developed a bad odor typical of putrefaction and gas from deep spoilage bubbled to the surface in many spots. The control also showed areas which were slimy and a semi-liquid fatty material dripped from other portions. In contrast, all treated quarters showed no evidence of gas and no putrefactive odor was apparent.

Intraperitoneal injection also is practical for large cattle in commercial slaughterhouses. In regular practice the cattle would be run through a restraining chute and the injection made before they were introduced into the holding pens. They could be slaughtered one to four hours later.

Oxytetracycline levels in the tissue as low as 0.5 ppm. were very effective in inhibiting putrefactive bacteria for 48 hours at room temperatures.

Further refinements of the intraperitoneal method of preservation were worked out by additional experiments on sheep. Sixteen animals were treated.

In general, the acidified quaternary complex of oxytetracycline gave blood and tissue levels comparable to those obtained with the hydrochloride. The levels obtained at one hour and two hours after injection also are approximately equivalent.

One half of each carcass was frozen and the other half hung in a room held at 80°-85° F. The control animals and animal No. 9 began to give off strong odors after 48 hours and by 72 hours the flesh had turned dark with a greenish cast. The other treated animals had

no evidence of gas or spoilage odor and the flesh remained bright in color. The flesh of the spoiling meat became soft and spongy while that of the others remained firm. Two animals of the group (including No. 9) did not develop proper antibiotic tissue levels, possibly as a result of faulty injection technique. From this work, it appears that there is no significant difference in tissue levels obtained with waiting times of one hour as compared with two.

Because of the strong odor of the spoiling animals, the entire group had to be moved after three days to a room in which the temperature was not controlled but varied from approximately 85° at night to 100° F. during the day. After five days all treated carcasses had begun to give off a moderately strong odor but did not smell putrid nor did the flesh become soft and gassy.

The intraperitoneal injection procedure has been applied also to swine. There were two controls, two animals injected with oxytetracycline quaternary ammonium complex and two injected with oxytetracycline hydrochloride. One of each pair of injected animals was killed one hour afterwards and one two hours afterwards.

Tissue levels of oxytetracycline obtained are shown in the following table.

TABLE 12: OXYTETRACYCLINE CONTENT OF SWINE CARCASSES INTRAPERITONEAL INJECTION, 3 Mg./Lb. body weight

Animal	Anti-biotic	Form	Heart	Muscle	Tissue Levels, mcg./gm.			
					Kidney	Liver	Fat	Blood
1	None		<0.55	<0.5	<1.5	<1.5	<0.5	<0.6
2	None		0.95	<0.5	<1.5	<1.7	<0.52	<0.6
3	HCl - 1*		4.3	3.0	37.	41.	0.94	4.1
4	Q - 2		0.57	<0.5	1.8	1.8	<0.5	<0.6
5	Q - 1		2.3	2.2	21.	9.2	1.6	2.7
6	HCl - 2		2.6	2.0	21.	9.2	5.4	2.3

*HCl = oxytetracycline hydrochloride; Q = quaternary complex; numerals 1 or 2 denote hours elapsed before slaughter.

Periodic observation of carcasses held at room temperature showed spoilage in 24 hours in carcasses No. 1 and No. 2 as evidenced by development of a putrid odor and a greenish-color. By 48 hours gas bubbles were forming in the loose tissues. At 48 hours, animal No. 4 was showing signs of putrefaction. The remainder of the carcasses remained in an acceptable condition for 48 to 72 hours.

In addition to the regular sides of pork noted above, duplicate sides of animals 1, 3 and 5 were hung and open surfaces sprayed with a mixture containing 0.5 per cent carboxymethyl cellulose, 10 ppm. oxytetracycline and a wetting agent. Considerable improvement was noted in the cut tissues of the sides so treated as compared with controls. A slightly heavier film than was obtained in these experiments is probably desirable, but slight formulation changes undoubtedly could accomplish this.

This trial indicated that intraperitoneal injection of hogs is easily accomplished, even though the injection site is not as clearly delineated in them as in ruminants. Oxytetracycline again had a retarding effect on putrefactive changes. The antibiotic spray coating of open cut surfaces promises also to be a further improvement of the overall method of meat preservation by antibiotics.

AMI SESSION

ENGINEERING & CONSTRUCTION

Air-Conditioned Smokehouse Design—L. J. Pircon, chemical engineer, American Meat Institute Foundation.

Automation in the Meat Industry—C. E. Evanson, president and general manager, TAB Engineers, Inc., Chicago consulting firm.

Equipment Design for Freezing Prepackaged Product—Leon Buehler, jr., chief refrigerating engineer, Creamery Package Manufacturing Co., Chicago.

Industry Refrigeration Problems—A panel discussion by members of joint American Society of Refrigeration Engineers—American Meat Institute committee on refrigeration: K. E. Nielsen, International Packers, Ltd., Chicago, chairman; K. E. Wolcott, Julian Engineering Co., Chicago; C. D. Macy, Geo. A. Hormel & Co., Austin; F. P. Neff, Tupman Thurlow Co., Inc., Chicago; R. W. Ransom, John Morrell & Co., Ottumwa; L. E. Joslin, Krey Packing Co., St. Louis; W. C. Matthews, Armour and Company, Chicago, and B. Starr Parker, Tennessee Packers, Inc., Clarksville, Tenn.

What You Should Expect Of Smokehouse



L. PIRCON

• Even though meat was smoked during and probably preceding the Summeranian period, the greatest advance in the design of smoking equipment appeared in this century. The greatest improvements have been made during the last 20 years, but, in spite of this, the packer or sausage maker still has occasional operational difficulties. Most of these are due to weakness in either maintenance or design. It is the purpose of this paper to explain what you should expect of your smokehouse and what it expects of you.

Perhaps the best approach to this subject is by way of a look at the evolution of the smokehouse. Initially it may not even have been a house, but some support over a smoldering open fire. The North and South American Indian smoked meat in a tepee over a camp fire, using hickory and oak, but the more primitive Indians used semi-dry grass, sage and various aromatic seeds and plants.

The European hung his product in his attic which was filled with smoke from his combination heating and cooking oven. In 1650 Glauber referred to the preservative action of wood tar; or in his own words, the "oily part of the distillation of wood which is more fixed than the acid." However, in the latter part of the 18th century, brick smokehouses were used which were closed up and had smoke pits or used cold smoke by passing smoke generated in an outside pit through a connecting tunnel into the house.

These remained essentially the same until approximately 1905 when steam coils were used to heat some

houses. In the early 1920's, insulation of smokehouses and external smoke production became popular, and by 1928 an air-conditioned smokehouse was designed and built for smoking fish. Meat was not smoked in an air-conditioned house until the early 1930's when a design was brought in from Leipzig, Germany.

At first the unit heater and smoker were externally controlled. Some had humidity control but this was with provision for drying only, and by 1938 steam injection was used for complete humidity control. This brings us to a setup which consists of a room in which the product is hung, an external smoker, heater and humidifier and a fan, duct, plenum chamber and damper system which supplies the product-filled room with the conditioned air.

DESIGN AND MATERIALS: Let us now study some of these units in more detail by beginning with the room (Figure 1, a). The walls are normally constructed of either stainless steel, black steel, or tile. Black steel is the cheapest, but because it is subject to corrosion it is not too popular. Stainless steel is corrosion resistant, and, because thin sheets are used in the prefabricated sections used to assemble the wall and roof, the cost is not prohibitive.

Normally a 2½ to 4-in. thickness of insulation is used with steel; however, if any wall or roof is exposed to colder air than the other walls, a greater thickness of insulation should be used for this wall to minimize variant wall temperatures. Tile does not require insulation except when exposed to cold conditions; but, because of its added bulk, its heat retention is greater and the warm up and cool down time of the house is increased appreciably. All three are fairly easy to keep clean except for rust control in the black steel and mortar roughness and absorption when tile is used.

Acid-resistant brick and mortar, concrete or stainless steel are used for floor construction. The use of concrete is not popular normally because it decomposes under the influence of cycling temperatures, humidity and dripping

fat. A stainless steel plate heavy enough to serve as flooring is rather expensive, and, as a result, acid-resistant brick is the most popular flooring.

If a shower is installed in the house, water flow rate must be considered in sizing the drains and grease trap. The doors are normally made of stainless steel and are gasketed to prevent smoke leakage. An observation window is mounted in at least one door and a disconnect mechanism is used in the event a man is in the house when the doors are closed and locked so that he can open them from the outside. This should be checked and kept free during the life of the house.

Smoke leakage between panels is rare; most of it occurs at the doors, ducts, plenum chambers, duct entry and blower shaft.

AIR CONVEYANCE SYSTEM: The next unit to consider consists of the fan, duct, plenum chamber and damper system which supplies the room (Figure 1, b).

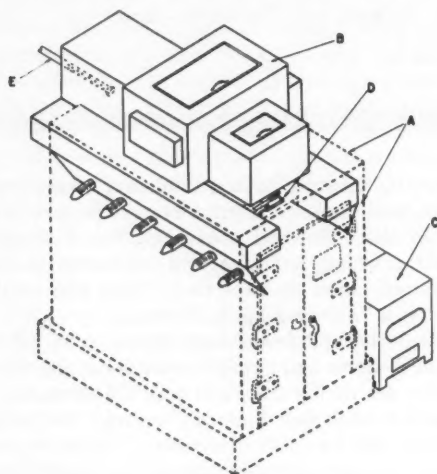


FIGURE 1

Two general fan types are used for this purpose: cage and propeller fans. Thus far the cage type is most used commercially; this fan has blades mounted along and perpendicular to the periphery of two parallel circular plates.

The spinning of this "paddle wheel"-like assembly draws air through a hole in the center of one or both side plates and forces it out at the periphery, imparting to it, at the same time, an increase in pressure and velocity. The characteristics of this blower are modified by the number, size and shape of the blades.

The most popular type of blade is the forward curve because, for a given pressure and volumetric flow, it requires approximately one-half the shaft velocity that a backward curve unit of same diameter and blade number needs. However, if the slight increase in noise due to the higher velocity can be tolerated, the backward curve is preferable because a slight volumetric or pressure overload will not burn out the motor as in the case of the forward curve.

Also, deposits of smoke condensates build up on the forward curve blades much more easily than on the backward curve; a rigorous cleaning schedule must be maintained or the fan characteristics will change rapidly. The cleanest operating fan is the propeller or axial flow

type. Any deposit on the blade is thrown off by centrifugal force. Its main disadvantages are the noise of operation and bulk of housing which may not fit into a limited space installation. In addition, it is not advisable to use it for pressure heads much over 5 in. of water.

Regardless of the fan choice it should be sized to provide approximately eight house changes per minute and no less than four. A steam injection or hot water wash system should be installed with the unit, or access points should be provided so that the blower can be cleaned frequently.

This comment also applies to the plenum chamber and duct work. Sharp edges should be avoided because these are ideal build-up points for deposits. Flow obstructions should be avoided because of build-up as well as friction loss. If both fresh air entry and smoke entry are located on the plenum chamber, care must be exercised to avoid higher than atmospheric pressure being built up at the fresh air entry or smoke will back up into the room where the smokehouse is located. The smoke entry must not face the fresh air entry or have its smoke effluent reflect toward the air entry for the same reason.

This is especially important in case a blower is used to carry the smoke from the generator into the house. The outside duct work and chamber are normally made from galvanized steel and the inside ducts are stainless steel. Access doors should be provided so that the nozzles can be cleaned, or the panel on which the nozzles are mounted should be hinged so that it can be swung open, thus exposing the material build-up around the nozzle outlets. Duct connections should be caulked prior to and after they are fitted together for a smoke-proof seal.

SMOKE GENERATORS: Now that means of circulating the smoke-laden air have been provided let us concern ourselves with the problem of getting the smoke for this circulation and then the technique of conditioning and introducing the air-smoke mixture into the house (Figure 1, c). Smoke generators can best be classified according to the way the sawdust and air are supplied to the burning zone.

A batch type generator is one in which the sawdust is loaded batchwise into the combustion zone and the burning follows the sawdust rather than vice versa. The unit in which sawdust is fed continuously to the fire is referred to as a continuous feed generator. The air used for burning the sawdust can be drawn into the combustion zone by the natural draft of the smokehouse or by a blower in the duct leading from the generator to the smokehouse.

Air can also be blown through the combustion zone by a blower or compressed air jets mounted below the fire. An aspirator is usually used with the latter to minimize the load on the compressor. The lowest initial investment is required with the batch type, house-draft unit. Because of its dependence on the house draft, this setup is not feasible as a generator for more than one house. Its second limitation is that the operator must learn how to set the generator draft doors for a given smoke output and house draft, and should the draft conditions change the setting must be changed or a variable smoke output is encountered. Sometimes this change is great enough to put out the fire or fan it into a flame, neither of which is desirable.

This condition is not eliminated entirely by mounting

a fan in the outlet duct of the generator because, as the fire burns, the area of exposed grate changes and the air split for combustion and house supply changes. This is especially exaggerated when the house has no other fresh air inlet except through the generator. To gain greater combustion control, a generator using air blown through its fire should be employed.

If the sawdust burning rate necessitates too big a batch type combustion chamber, a continuous feed unit can be used. Vibrator, sweep plow, finger rake mechanisms and

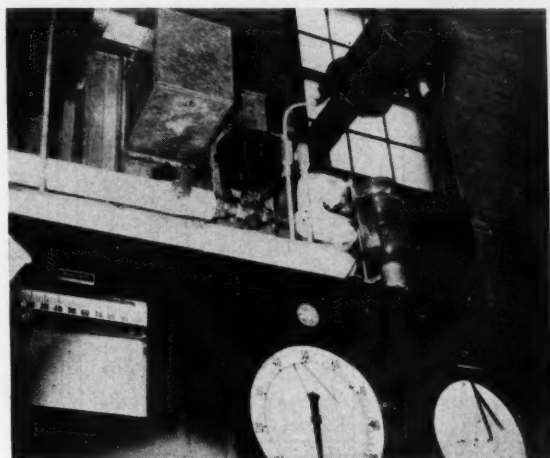


FIGURE 2

blown air-sawdust transfer units are used commercially. The blown air-sawdust system is best suited for large installations and the vibrator unit for small installations. The rake and plow systems are applicable over a wide range.

A Bailey smoke densitometer, consisting of a bolometer and sealed beam lamp, is being used to measure smoke density at the Foundation laboratories (Figure 2). This has indicated the possibility of controlling even the

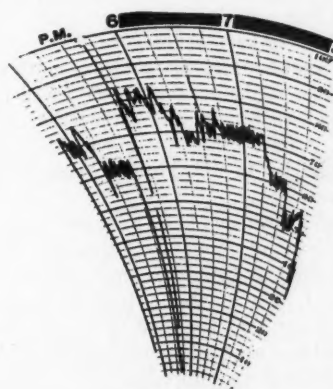


FIGURE 3

smoke of the fan-drawn draft, batch type generator by turning the fan on and off according to the densitometer indication (Figure 3). This density measuring unit might make it feasible to follow a smoke density schedule for optimum product processing results, much as temperature and humidity schedules are used today.

Regardless of the choice of generator, provision should

be made for easy cleaning of the smoke duct and fire pot to minimize the fire hazard. If the generator is not equipped with fire alarm and control apparatus, then the house should be.

AIR CONDITIONING UNITS: Circulation and smoke generation systems have been cited thus far; but, before the air can be blown into the house, provision must be made for conditioning it with respect to temperature and humidity. The problem of temperature conditioning resolves itself into three general considerations: 1) Heat source; 2) Location of heat source, and 3) Instrumentation.

A cold source does not have to be considered except in connection with special products such as summer sausage, or in connection with humidity control, which will be discussed later. The heating can be done with either gas or steam. If gas is used, the heating and cooling action is more rapid because it involves a direct heat transfer from flame to air instead of from metal to air as in the case when steam is used.

Secondly, a gas-heated house is easier to keep clean in that any deposits are burned off. However, a heavier, alloy housing must be used and safety measures must be employed which are not necessary when using steam. Pre-mixing of air and gas, safety cutoff on flame loss and similar design techniques must be employed to prevent explosion. Even the best gas jet designs for this purpose can have their flames blown out by air flowing perpendicularly to them at a velocity of more than 1,000 ft. per second.

In the majority of plants where processing steam is needed anyway, steam is the cheapest heat source. The location of the heat source should be in the return duct ahead of the blower. It should be accessible for easy cleaning and repair. If a finned steam coil is used, the distance between fins should be great enough to allow easy brushing of the fin surfaces.

Because of the necessary safety precautions, the instrumentation for a gas heater is much more complex than for steam. However, in either case, the sensing element for temperature control is the dry bulb. If this is used in connection with a wet bulb, it should be located near the wet bulb (the exact location will be discussed in greater detail later). In any event, especially when using gas as the heat source, the bulb should not be allowed to "see" the heat source because radiation from the heat source might introduce an error in reading (Figure 1, d).

The task of conditioning air humidity-wise is a little more difficult. Most houses have provision only for increasing the moisture content of incoming air, but not decreasing it. However, this suffices for most processing conditions except on a hot humid day when the moisture in the incoming air, plus the moisture from wet product, may cause the house to operate at too high a humidity level, even though the recirculation percentage is held at a minimum.

If an operating schedule and conditions of this nature are encountered frequently, a refrigeration unit must be used to de-humidify the incoming air. In any case steam is most commonly used as the moisture source. If steam is not available, a nozzle or disc atomizer may be used.

To prevent direct wetting of product, high humidity concentration at product and excessive fouling of blower and heater coil, the moisture injector should be mounted

in the duct outside of the house just after the blower outlet before the entry into the house (Figure 1, e). This duct area should not be subjected to drafts or other cooling in order to minimize wall condensation. This, of course, holds true of all duct work; if any appreciable length of duct is needed, it may have to be insulated for draft cooling as well as heat loss reasons.

The wet and dry bulb sensing system is used to indicate, record and control humidity in the house, but it has several important limitations. Because the wet bulb reading will be in error if the air does not blow past the element rapidly enough, it must be located in a high air velocity zone. The most convenient position is at the house return outlet constriction (Figure 1, d).

However, this may not indicate humidity conditions at the product. Secondly, because the temperature depression of the wet bulb is due to water vaporization from a cloth, the fouling of the cloth with some of the sawdust distillates formed in the smoke generator might interfere with this depression enough to cause an error in reading. This can be minimized by frequent sock changes and allowing a slight flow in the well feeding the sock to promote a slight washing action, but this must be slow enough so as not to affect the soaked sock temperature. This, however, can lead to a third error.

No matter how slow the water feed rate to the well is, if the water is fed cold, it may depress the sock temperature more than the air cooling effect did, and thus give an erroneous reading. To minimize this effect the tubing that carries the water to the well should be coiled in the house to act as a heat exchanger and bring the feed water to approximately the dry bulb temperature of the house.

A fourth source of error is related to the lag or error of the dry bulb reading because relative humidity is dependent on the combination of wet and dry bulb readings. This error is especially exaggerated if the dry bulb reading is taken at a point far enough removed from the wet bulb so as not to read the air temperature to which the wet bulb is exposed.

Studies are being initiated at the Foundation laboratories to develop an absolute humidity measuring system which would eliminate all of these errors. Instrumentation for this project is being provided by the Brown Instrument division of the Minneapolis Honeywell Regulator Co.

INTRODUCTION OF CONDITIONED AIR:

Now that means for conveying, smoking and conditioning the air have been provided, it is ready to be introduced into the house. This is currently being done by blowing it through nozzles pointed at the floor where it expands, swirls about, reverses its direction and flows at a lower velocity up through the product and back into the return duct (Figure 4). This must be done so that the temperature and humidity are essentially the same in the region of the product. If the air can be imagined as suddenly being converted into water, a clearer understanding of the patterns of temperature and flow will be attained.

Picture water issuing from some nozzles at a different temperature than from others. If the water flowed slowly, there would not be much mixing in the house and the temperature difference could still remain even after the water left the nozzles and filled up the house. How-

ever, if the velocity of the water through the nozzles were increased to the point where a vigorous churning within the house were maintained, it is obvious that no appreciable temperature difference could exist because of the mixing.

This condition of churning, either in the case of water or air, is called turbulence. For this reason the number of house changes per minute, nozzle diameters and number of nozzles should be chosen to obtain as much of this churning effect as possible. Caution must be exerted

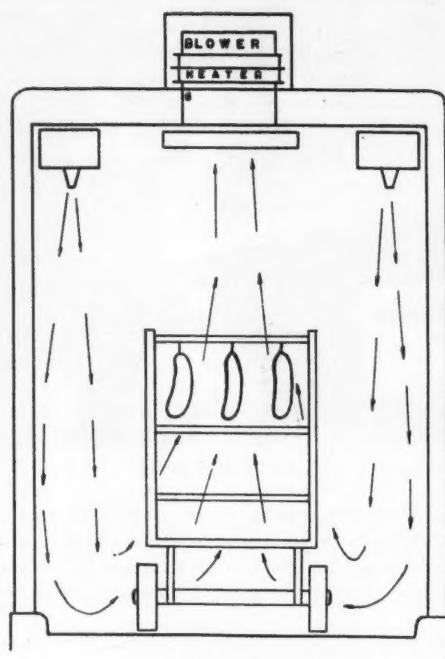


FIGURE 4

humidity-wise to prevent excessive drying of the product under these high velocity conditions.

The floor should be kept free of any objects or projections which might reflect the air in an undesirable pattern. The slant on the curbing should be such as not to reflect the high speed air from the nozzles directly onto the product. A return should be used which will prevent the air from having to crowd at one point in order to get out of the house.

A balanced return should be provided to prevent the air from one bank of nozzles from having a shorter path to the outlet than air from the other bank depending on the same outlet. The number of projections in the ducts, nozzles and house that the high velocity air encounters should be kept to a minimum and these should be streamlined to minimize the pressure loss and the blower power needed. Venturi throat nozzles will be tried at the Foundation to determine their effects on flow pattern, pressure loss and power consumption.

If the basic design principles discussed in this paper are adhered to, and a house is built which gives satisfactory results, the best way to maintain that satisfaction is to maintain the house. Lack of a regular, frequent schedule of cleaning may result in a change in house characteristics with consequent operational difficulties.

You Can't Afford Not To Automate

• Industry, today, has a big job ahead of it. In the next decade or so it must destroy 8,000,000 to 10,000,000 jobs.

We have to eliminate that many jobs because in the next 20 years our population is going to increase by 55,000,000 people. That is equivalent to adding 12 average size states to the union. Our working force, however, will increase only by about 15,000,000.

Our standard of living is increasing. It has been rising at the rate of 2.5 per cent per year for the past ten years, but our productivity per man has increased only by 2.4 per cent per year in the same period.

Leisure is increasing. Currently, we have a standard work week of 40 hours. But can anyone guarantee that we will still be working 40 hours per week 20 years from now?

Inventions and new products are being brought forth at an ever increasing rate. And each new factory erected to manufacture a new product increases the competition for a share of the available working force in our country. With all these obvious factors staring us in the face, no reasonable man can fail to realize that we do not have a working force large enough just to maintain our present standard of living, let alone increase it.

If we assume a minimum age of 20 for a worker, then we readily see that every worker for the year of 1975 already has been born. The total is fixed; there is nothing we can do about increasing our work force now—except automate.

The only way we are going to produce more is by automation. There is no other way. Politicians are not going to solve the problem of more production by legislation. Economists are not going to solve it by juggling figures. You, the manufacturers, the producers, the engineers, are the hope for a world of plenty. If we are going to have more people, we are going to need more food to feed them. Therefore, you will have to produce more food. To produce more food, you will require more people, but there are not going to be enough workers to go around 20 years from now if we use the same manufacturing methods then as we do now. It readily becomes apparent that the companies which automate first have the best opportunity to get the lion's share of our expanding market. They will be the ones who will have greater sales potentials through increased production, improved quality, reduced cost and stabilized employment.

The non-automated plants will be the "also rans," getting the crumbs left over from the more efficiently run organizations, constantly combating uncontrollable seasonal ups-and-downs, and living from one period of lay-offs to another.

When we speak of an automated plant of the future, we speak of automation from the receiving door to the shipping door, including the office. When we speak of an automated plant of today, we speak of that part of automation which can be economically adapted to to-



C. E. EVANSON

day's plant through the use of the techniques and tools available. This does not mean that automation is not here today. It is here but in varying degree in different industries.

The meat industry is generally credited with introducing the concept of straight line production, which Ford admired and copied. The copier of the concept has carried its development and perfection way beyond that ever known or used in the packing industry until now, the modern line with its perfect balance and integration with other lines, its continuous flow, and its automatic control is hardly recognizable as being the direct descendant of the packinghouse straight line concept.

In spite of any belief that these later developments are not applicable to the packing industry, they none-the-less are applicable and are being used today to some extent in your industry. However, when one outside your field sees what other companies and other industries are doing in automation—companies which do not have the volume, do not have the assured markets, or the stable product which you people are so fortunate to have—it becomes difficult for many of us in automation engineering to understand why your great industry does not do more in the field of automation.

A survey conducted by Roger Bolz, editor of *Automation Magazine*, covered 921 diversified plants across the country, ranging from small to so-called "blue chip" companies. They reported that budget expenditures for automation for 1955 were set at \$347,000,000. There can be no doubt that automation is here today, and your company can be a part of this expanding economy, undreamed of a generation ago.

What is automation? Some confuse automation with mechanization. Others say that automation is just mechanization dressed up in a new suit of clothes. That is not true. Mechanization is just an extension of the brawn and muscle of man. Automation is that plus the tremendous extension of man's senses, his touch, his sight, his hearing, his memory and his brain.

How can automation be applied to a packing plant? Nearly every packing plant has a sausage kitchen wherein are performed the same operations of grinding, seasoning, and mixing, stuffing and cooking, and in some



NOW IN THE OLD DAYS, seems to be the theme of this somewhat contemplative lobby group.

cases smoking, and then packaging. You have the problems of temperatures, humidity control, control of weight and size, moisture content, consistency, quality, taste, etc. When we consider automating a sausage department, we are confronted immediately with the formidable problems involved.

Every sausage department has a diversified range of products, different products, different formulas and different operations. These problems can dismay the uninitiated who have not encountered and surmounted similar problems in similar industries, but once the various formulas have been developed and have been based upon factors which can be measured, then it does not matter how many formulas you have or what balance of ingredients you use, because whatever the balance requires, you have a formula for it. Controls developed for your processing will enable you to produce your product according to your formula more positively and more consistently than with any skilled operator. In other words, you use the skill and experience once to develop the formula and formulation. From then on you allow the equipment to do the work and use the controls to see that the equipment adheres to the process. The same principle applies all along the production line. When certain formulas need more time for cooking or require different temperatures, the equipment is pre-set at the same time at which the formula was decided upon. Once established the equipment maintains its setting through feed-back control.

Today, any company can have an automated kitchen. The only limitation to automatic continuous processing is the present status of the stuffing operation. As you know, a great deal of time and effort is being put forth currently to develop a casing which can be fed and stuffed continuously and automatically. When this is accomplished the manufacturer of sausage will be completely automated from the beginning of the kitchen operation through the packaging because automatic means already have been developed for linking, handling, weighing and packaging the product.

With proper electrical and electronic controls, the sausage maker who produces relatively small quantities of various sausage can be automated as efficiently as the larger producer who manufactures one type of sausage on each production line. Just as electrical test circuits can be changed instantaneously by inserting a punched card into a reader in place of a differently punched card so can the smaller sausage kitchen, which has many small runs of different formulas, change from one formula to another.

Each card represents a formula and process, which, when used, carries the product through its particular operations and controls the formula, weight, temperature and time, etc. Naturally, a different card is required for dry sausage than, for example, for domestic sausage.

It is not necessary that a product be a fluid or semi-fluid to be adaptable for automation. Neither is it necessary that a product be completely uniform. As another example of how a product can be automated, consider the non-uniform bacon belly. Instead of cured bellies being weighed and segregated manually, hung on hooks manually, hung on trees and pushed into smokehouses manually, pushed into coolers manually, allowed to take up valuable space while being cooled, loaded into presses



WESTERN FLAVOR is given this snapshot by the presence of Cornelius Noble, W. S. Marks and Henry Kruse.

manually, transferred to slicers manually, separated into groups manually, graded manually, weighed manually, and wrapped and packed manually, in the not too distant future a line will be unveiled which will segregate the bellies according to weight automatically, transport them through the automatic smokehouse and into a quick chill unit. From the quick chill unit they will be transferred automatically to a press and without the aid of human hands will proceed directly through the slicing operations. The slices will be counted automatically and weighed automatically. Finally, the drafts will be packaged and packed automatically.

It is anticipated that an automatic line will produce two to three times as much as what is known today as a standard bacon production line. More than two full days of production time will be saved in the process. Finally, and perhaps most important, a closer control and a more uniform and higher quality product will be produced from such a line because the product is no longer subject to the vagaries of human inefficiency and disinterest.

Naturally, a program of this type is not put into operation overnight. It is done step-by-step, but as each step is installed, it is installed according to the preconceived overall plan. A program such as this costs money, a good deal of money, but actually it costs absolutely nothing. It costs nothing because the savings in waste, the improvement in quality, the upgrading of the product, and the greater production per unit of labor add up to additional profit which will pay for the initial investment many times over. In some instances, an automated line can pay for itself in less than a year. In any case, a well conceived, thought through and properly planned program of automation will pay for itself in two, three or four years.

Actually in many cases it costs more not to automate. It costs more not to automate because any plant or department within a plant which can be automated and is not is paying for automation without receiving the benefits of automation. With automation less space is required per unit of product produced, less inventory in process is required, less labor per unit of produce produced is required, less spoilage and less waste per unit is encountered. With automation you will have a higher quality, more uniform product, less arduous work for the employees, lower costs and better control over your entire production process.

Equipment Design for Quick Freezing

• Quick freezing is more than just a refrigeration problem. Perhaps of primary importance is that any equipment coming in direct contact with food products must be of sanitary and cleanable construction, and while I don't propose to elaborate on this point, it must always be kept in mind.



LEON BUEHLER

Beyond this, quick freezing becomes primarily a refrigeration and a materials handling problem, and includes such other very important considerations as packaging and preparation of the product prior to freezing. Let us first of all consider the subject from the viewpoint of refrigeration. Perhaps we can define the aim as "to freeze the meat as rapidly as is economically practical with the least amount of shrinkage and at the lowest possible cost, considering both initial investment in plants and buildings, as well as cost of power and labor."

Historically, there have been many freezing methods used, the simplest, of course, being hanging the meat outdoors where a severely cold climate exists.

Other methods comprise, for example, placing the meat in an autoclave where it is cooled and frozen by direct immersion in the primary refrigerant such as nitrous oxide, or, in the laboratory, dipping a meat specimen into a bath of liquid air.

Meat has been frozen in cans similar to the cans used in the manufacture of ice, the cans being immersed in a brine bath. Meat has been directly immersed in cold brine solutions; it has been hung in freezer rooms; but, especially when whole carcasses or large pieces have been so frozen, the process could hardly be called "quick freezing."

Particular when it is prepackaged, meat can be frozen in contact with heat-exchange surfaces, such as

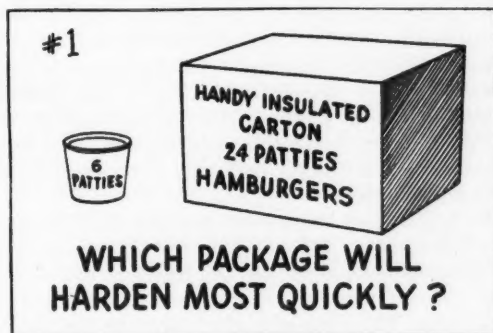


FIGURE 1

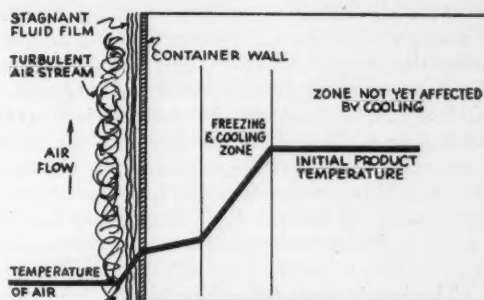
by placing a flat package between refrigerated plates. The plates are pressed together to form a good contact with the package so that the freezing process takes place by actual conduction.

Finally, and probably the most common process of all, is freezing in a tunnel where a high-velocity cold air blast is blown over the product.

Let us list some factors governing the rate of freezing:

1. The lower the temperature to which the product is exposed, the faster will be the freezing. Heat will be given up by the meat in direct proportion to the difference in temperature between the meat and the surface with which it is in contact, or the media with which it is surrounded—whether brine or air.

2. The smaller the piece, the quicker will it freeze. The freezing time is proportional to the square of the thickness, so that if you double the thickness of a steak it will take four times as long to freeze it. Shape has something to do with this too. It is not just a matter of having the cold penetrate through the smallest dimension. All of the surface should be exposed so that, for example, if we have rectangular packages, they should



TEMPERATURE DISTRIBUTION THROUGH A FREEZING PRODUCT. WATER VAPOR PRESSURE WOULD FOLLOW A SOMEWHAT SIMILAR RELATION.

FIGURE 2

be spread out so as to allow the cooling air to get at all of the six surfaces.

3. The properties of the product itself will, of course, affect the freezing time. For example, freezing is primarily freezing the water portion of the product, so that a substance having a high percentage of water will have a higher latent heat than one with a low percentage. In addition to that, the thermal conductivity of the product will determine how quickly the heat can travel from the center to the surface; and so, for example, fat is easier to freeze than solid meat.

4. If the meat is packaged, the package itself will affect the freezing rate. Obviously, we wouldn't put the product into an insulated container (let's say, perhaps a box made of cork) and expect to be able to freeze rapidly. But the package itself may be a very good conductor—for example, like a tin can—but if the product doesn't rather completely fill the package and isn't in intimate contact on all surfaces, the transfer of heat will be impeded because air spaces are relatively good insulators—especially narrow air spaces where convection currents do not operate efficiently.

5. If the product is cooled by a cold fluid, such as air, proper air circulation to minimize the thickness of the stagnant film in contact with the product will accelerate freezing. As is well known, rate of heat transfer between an airstream and a surface depends upon the air velocity, the dimension of the airstream (there being a decided advantage in favor of thin streams), and other factors governing turbulence—such as staggered arrangement of surfaces against which the air is directed, and even the character of the surface with respect to smoothness.

Perhaps this statement can be made a little more clear

by saying that the packages should be spaced from one another, but not with too great a spacing, and the cold air should be blown between the packages at the highest practical and economically sound velocity. Furthermore, if the packages are staggered so that the air has to go through in a sinuous stream, the results will be still better.

Still looking at the problem as one strictly of refrigeration: In order to keep the investment in refrigerant compressors to a minimum, and also in order to keep the power cost for running the refrigerating plant to a minimum, we should operate at the highest possible temperature. Of course, that's in direct conflict with the fact that the lower the refrigerating temperature, the quicker will freezing be accomplished.

That paradox simply tells us to use a little judgment in this matter of how fast we're going to freeze and to remember that it costs a lot of money to provide a very cold refrigerated temperature. However, it should also remind us that we should provide sufficient heat transfer surface of high efficiency to minimize the temperature difference between the refrigerant and the chilled air.

It's about time we considered the matter of shrinkage. Simply stated, "shrinkage" is the loss of moisture from the product during the freezing process, and it will be affected by many considerations including the following:

1. The loss in moisture will be in direct proportion to the difference in vapor pressure within the product and the surrounding atmosphere, or, more accurately, the film of air immediately in contact with the product.

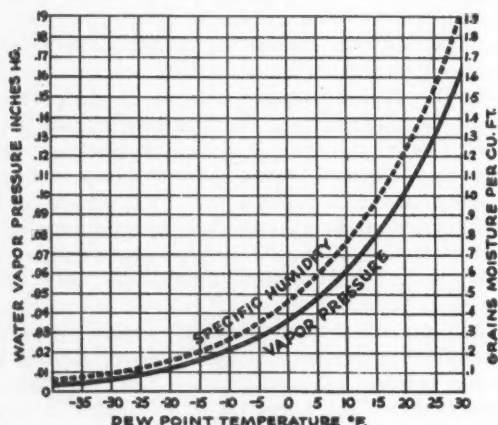


FIGURE 3

As a consequence, we can say that to minimize shrinkage, the surrounding atmosphere should be at a high relative humidity, and should not be much colder than the product itself. Further, that rapid air movement adds to the loss of moisture because it sweeps away the stagnant film next to the product.

2. Other things being equal, loss of moisture is proportional to time.

3. Loss of moisture is proportional to the ratio of exposed surface to volume, so that the per cent shrinkage would be much greater for a thin slice than for a heavy chunky piece.

Let's consider for a minute what this means in the design of equipment. In order to have the cooling air at high humidity, it is necessary that the cooling surface be of liberal size and good efficiency, so that the tempera-

ture difference between the air and the refrigerant is kept to a minimum, for this will determine the humidity of the air leaving the cooling coils. In other words, provide plenty of cooling surface. But it also means that the temperature rise of the air in contact with the prod-

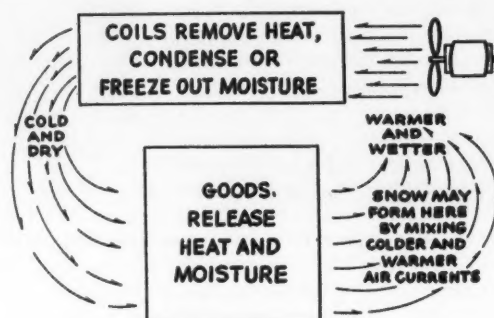


FIGURE 4

uct shall be kept to a low value, because rise of dry bulb temperature permits the air to pick up more moisture from the product, until the warmer air has become saturated.

If we think of the airstream as picking up heat and moisture in passing over the product, then it will return to the cooling coil at a higher temperature and carrying more moisture, and in passing over the coil it will be cooled down again and the moisture it picked up will be frozen out.

From the specific humidity curve, you can see that for an increase in dewpoint from -35 to -30° F., a cubic foot of air will pick up only .025 grains of moisture; whereas between 0 and $+5^{\circ}$ it will pick up .13 grains, or about five times as much. On the face of it, it would appear that very low temperature airstreams would not be as drying as warmer air, and that therefore, both from a viewpoint of most rapid freezing and minimum shrinkage, very low air temperature would be desirable.

Not only may warm air pick up more moisture, but (due to the longer freezing period) this effect is multiplied. On the other hand, by using warmer air, the vapor pressure difference between air and product is much lower, and hence there is less driving force to draw the moisture out of the product. It is therefore unlikely that the higher temperature air would become even nearly saturated, so that it would not be apt to pick up moisture to its full capacity.

W. J. Finnegan has pointed out that the film of air next to the product will take a much greater temperature rise than the main airstream, and therefore will pick up more moisture than can be calculated for the airstream as a whole. This film, as it mixes with the main colder stream, can no longer hold this extra moisture and we then have a snowstorm in the tunnel. It is a fact that much loose snow falls out in these tunnels.

Finnegan claims that stage cooling, i.e. bringing the product in contact with successively colder airstreams as freezing progresses, actually results in far less drying. Certainly it does save in power and in the size of refrigerating plant.

You may raise the issue that you are dealing with packaged meats, and that you are using a very fine vapor-

proof packaging material, so the matter of shrinkage that we're talking of doesn't concern you, because you keep the moisture from getting out of the package.

That might be true if your package were in intimate contact with the product at all points as, for example, if you had a completely filled tin can. That condition, of course, you can't have, because you've got to leave a little space for expansion due to freezing. In many cases, for one reason or another the product does not completely fill the package. Now let's examine the consequences:

In the first place, we know that a loosely-fitting package will interfere with heat transfer and will slow down the freezing rate. As concerns shrinkage, let's refer back to what happens in the storage room.

Moisture is picked up from the product and transferred

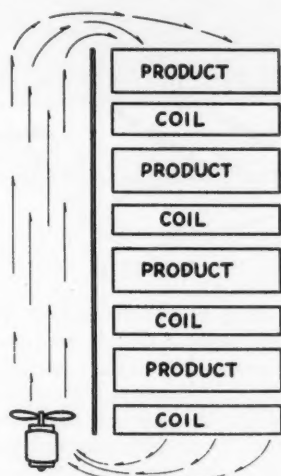


FIGURE 5

to the cooling surface, where it is frozen out. Now we can think of the package as a miniature cold-storage room. If the surface of the package is colder than the product, moisture is given up by the product and is carried to the colder package wall, where it is frozen out.

You can observe this on many frozen food packages, where the product is covered with snow. And this holds true regardless of how the package itself is chilled. As far as the product contained within the package is concerned, it responds only to the temperature of the surrounding package, and it cannot sense what the mechanism for cooling the package may be, so it wouldn't seem to make any difference whether the package is cooled by direct contact, as in a Birdseye machine, or whether it's in an airstream.

Don't misunderstand me, however. I don't mean to say that vapor-proof packaging doesn't do any good. It may very greatly reduce shrinkage, as compared to unwrapped product, but there still can be and is shrinkage—particularly over long periods of storage, where there is some fluctuation in storage temperature.

I was scheduled to talk about freezing equipment. I don't believe that you men are interested in my talking about compressors, and whether to use single-stage or boosters. I believe you realize that when we go to air temperatures lower than -10° , it becomes very desirable

(if not imperative) to resort to two-stage refrigerating systems. However, I do want to speak about the type of equipment used directly in the freezing process.

There is a variety of contact-type freezers. In simplest form you have a pair of refrigerated plates. The plates are pulled apart and are loaded with packages. The plates are then clamped together with the packages in between, and freezing takes place by direct conduction. In actual practice, you don't have just two plates, but a whole stack of them. This is, of course, a batch system. There are modifications to make the process continuous, in which the plates are cyclicly released, the packages are pushed forward a space, and a new row of packages is brought in. And then, of course, the plates are clamped together again.

Another related type has a refrigerated channel into which packages fit with contact on top and bottom; the packages are pulled through this channel by a conveyor system. There are other variations of the same idea, which I'm not going to describe. This method is, of course, limited to packaged foods, and furthermore the packages must all be of one height—or at least at any one time they must all be of one height. Otherwise, the plates would not contact the low packages, because the higher packages wouldn't permit it.

Also, the packages must be flat-sided so that this method does place some limitations on what can be handled, but it has some advantages. Since the packages are frozen with pressure on the two main faces, bulging in that direction can't take place with expansion of product, and that's desirable because the packages stack better when they're kept flat.

With the exception of a small amount of power used for hydraulically clamping the plates together, there's no other power expenditure outside of the refrigeration system itself. This is in contrast with the sizable amount of power that's needed for fans in the air system. From a refrigeration viewpoint, these contact freezers are quite efficient, and permit operation at a relatively high suction pressure.

The other type of freezer which has great popularity is the freezing tunnel. Simply stated, it includes a conveying system of some sort to transport the food through a room or tunnel where chilled air is blown over the product to freeze it. It is principally in the conveying systems that the great differences in design are found. One of the simplest forms has a slat conveyor, or a wire mesh conveyor, on which the product is placed and which carries it through the tunnel.

Loading and unloading the conveyor may be effected by an automatic mechanism sweeping the packages off of a feed conveyor. There may be one conveyor belt going through the tunnel, or there may be a number of them, placed one above the other. This type of conveyor has the drawback that it can only actively carry product on its upper side, while the return carries no product. At the same time it takes up space, which is not very desirable.

There are modifications in such conveyor systems, where baskets are hung from a conveyor chain, or where a series of trays run in slides and over cams being pulled through by a conveyor chain in such a manner that there is no idle return strand of the chain. However, these conveyors cannot be 100 per cent active since it is neces-

sary to space the trays or baskets a certain distance from one another to allow clearance when they're swung around to the next lower tier. Nevertheless, this type of conveyor does conserve space.

Then there are various types having loose trays which may be loaded into carriers, suspended from a conveyor, or loaded onto buggies which are conveyed or pushed through the tunnel.

The use of loaded buggies or carriers is more or less of a batch system. The whole buggy is loaded with trays before it is pushed into the freezing tunnel, and then, possibly in another 20 minutes, another buggy goes in.

Still another system using trays consists of a high stack in the cold air blast. At spaced intervals, the entire stack of trays is raised high enough to permit a new warm tray to be slid in at the bottom of the stack, and the top tray (which by that time has been frozen) is shoved off the top of the stack to the outside of the tunnel. In any of these tray systems, of course, the trays can be loaded mechanically or manually.

As previously mentioned, it is important that the packages be properly spaced on the conveyors or on the trays, and that the trays or conveyor chains also be spaced, without excessive openings for air passage. Many freezing systems have very wide and open spaces between adjacent conveyor chains, and, while freezing can be accomplished, the maximum benefit is not attained from the velocity imparted to the air.

The arrangement and spacing of the conveyors or trays will dictate the direction of the air flow. Obviously, a layout in which the packages are spaced relatively far apart, due to idle conveyor chains, lends itself rather well to blowing the air lengthwise of the tunnel without getting into velocities that are too great in order to have sufficient air quantity in circulation to minimize temperature rise.

The better arrangement, where the open spaces between conveyors are blocked off, is to circulate the air crosswise. Another alternative is to blow vertically through the stack or through the load. Some authorities prefer periodically to reverse the direction of the airflow.

It is not necessary that the airstream blow through the entire load, then back through the coil, and to the load again. The load may be broken up into various sections, and the air circulation could be through the sections in series with a cooling coil between each section. The air quantity can thereby be very materially reduced, while still limiting the temperature rise. For example, if there are four such sections in series, there would be only one-quarter of the refrigeration load on each section; and hence you could get by with one-fourth the cfm., provided that the product is spaced close enough to give the desired air velocity for good, rapid cooling.

It should also be mentioned that where the product has not been pre-chilled before entering the tunnel, it is quite feasible and desirable to do the cooling in stages. In other words, when the conveyor carries the warm product into the first section of the tunnel, the air temperature in circulation might be $+20^{\circ}$, and, after the product has been exposed to this air for a certain period of time, it would enter another section of the tunnel where the air temperature might be -10° for further freezing and cooling. Such a scheme saves considerably on the size of the refrigerating plant, and on power.

You may raise the question "How high should the air velocity be?" The ASRE Data Book on Applications, 1954-55 volume, indicates that there is little advantage in going to velocities greater than 500 feet per minute. On the other hand, tests conducted by Dewey and Almy Chemical Co. showed that 5 lbs. of fish fillets in $2\frac{1}{4}$ -in. steel trays with -18° air temperatures cooled to $+5^{\circ}$ in $2\frac{3}{4}$ hours with 3,000 feet per minute air velocity as against $5\frac{1}{4}$ hours with 500 feet per minute.

The truth of the matter is that there are still other factors involved: product spacing, package type, etc.

Let's just examine what happens when a warm package enters the freezing tunnel. Let us say that the pack-

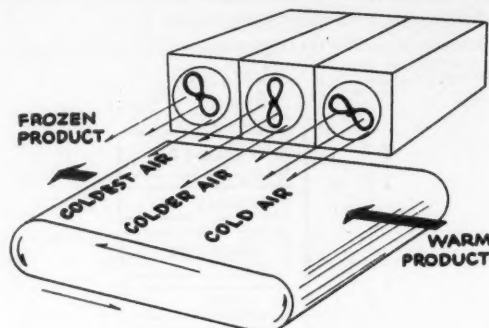


FIGURE 6

age is at 50° , which means the surface temperature is also at 50° . Let's suppose the air temperature is -10° .

We want the temperature of the outside surface of that package to be brought down as cold as possible and as rapidly as possible. It is obvious that as long as heat is being extracted from warm material near the outer surface of the package, if we can bring the surface temperature down quite low, a large quantity of heat will flow. Since high air velocity promotes heat transfer, a high velocity will very well pay for itself.

As the outer layers become cold, heat cannot flow out of the package as rapidly, because the heat then must come more from the interior of the package. Since the product itself acts as insulation, less and less heat will flow to the surface as time goes on. Eventually the product is entirely frozen and down to temperature, when heat flow ceases altogether. On that limiting condition, it doesn't pay to circulate air at all, because there's no more heat to transmit.

However, somewhere in between the two extremes we have a condition where the insulating effect of the product so restricts the heat flow that it becomes a bottleneck. As we approach that condition, a high velocity air circulation becomes less and less effective. Actually, then, it would be logical to have very rapid air circulation at the warm end of the tunnel, and have the air velocity gradually reduced toward the cold end. Whether such a complication would be worthwhile, is another question.

However, we can also draw another conclusion, and that is that the larger the package, the less effective is high velocity air circulation in reducing the freezing time. For very thin products it might pay to go to air velocities of 3,000 or 4,000 feet per minute, but for products 5 or 6 in. thick—or where the product does not properly contact the package—it might not pay to have air velocities over 400 or 500 feet per minute.



REFRIGERATION PANELISTS W. C. Matthews, Armour and Company; L. E. Joslin, Krey Packing Co.; Starr Parker, Tennessee Packers, Inc.; R. W. Ransom, John Morrell & Co.; Moderator K. E. Nielsen of International Packers Co.; K. E. Wolcott, Julian Engineering Co.; F. P. Neff, Tupman-Thurlow Co.; C. D. Macy, Geo. A. Hormel & Co., and E. N. Johnson of Swift & Company.

Refrigeration Problems Can Be Solved

MODERATOR K. E. NIELSEN: Refrigeration in the meat packing industry is a very fascinating field and it becomes even more fascinating if a statement is made that all refrigeration problems can be solved—and they can.

We might not all particularly like the type of solution that is required, but the decisions made are dictated by the most economical approach. Tad Jones once said that "Refrigeration is cheap in comparison to the value of the meat products being refrigerated." That is true, within certain limits, but certainly within most limits in the packinghouse industry.

Although this position gives the engineer a broad approach in designing an efficient refrigeration system, we must analyze the word "efficiency" because efficiency is measured in terms of the out-turn of the meat product. That is to say, to obtain the highest possible quality and the most pleasing appearance with the least possible shrink.

That immediately brings to mind to any technical man two very distinct questions. The first is: "What do we mean by desired quality, appearance and shrink?"

The second question is: "How can these conditions be obtained?"

An engineer must have the answer to these questions before he can even start his design; without them he doesn't know what he is designing. This committee was formed within the industry with the distinct task of establishing the required conditions to be obtained through refrigeration. Our technical committee is composed of engineers with companies supporting membership in the American Meat Institute or the American Society of Refrigeration Engineers. In many cases there is membership in both.

Since its initiation, the committee has submitted for publication a total of ten complete chapters of refrigeration application data. They cover beef carcass chilling coolers, beef carcass holding coolers, hog car-

cass chilling coolers, chilling coolers for lambs and calves, hog cutting department, lard production, preservation of smoked meats, hide curing and pork trimmings chilling. These publications, I understand, are all available at the literature stand of the American Meat Institute.

We have several papers to come in which you might be interested. One is on sausage dry rooms, another on fancy or variety meats and a third is on frozen storage. These papers are written specifically for the young engineer in a small or a large corporation. They are not fundamentally for production people.

Our panel members are: C. W. Matthews of Armour and Company; L. E. Joslin, Krey Packing Co.; B. Starr Parker, Tennessee Packers, Inc.; R. W. Ransom of John Morrell & Co.; E. N. Johnson, Swift & Company; C. D. Macy, Geo. A. Hormel & Co.; F. P. Neff, Tupman-Thurlow Co., Inc.; K. E. Wolcott, Julian Engineering Co., and myself, Knute Nielsen of International Packers Co., Ltd.

Many industrial refrigeration problems have been submitted to the American Meat Institute in the past several months and ten of these have been selected as the most provocative questions for discussion by this panel.

I'll call on one of the panel members to answer the question. When he has finished other panel members will be permitted to challenge, substantiate or comment on the solution presented by the original panelist. When the panel has completed the discussion of the selected subject, I'll open the forum to questions from the floor.

Our first question reads as follows: "At what point does increase in velocity of air circulation cease to be effective?" For this I'll call on R. W. Ransom.

RANSOM: Discussion of this topic is quite appropriate since Mr. Buehler's paper covered a lot of the subject and gives us something to start with. As he stated, product conditions have a great deal to do with the rate of chilling or freezing. However, we are not



VIRGIL R. RUPP, manager of quality control of Kingan Inc., Indianapolis was the recipient of the first Dodge & Olcott achievement award for an outstanding contribution to the growth and general welfare of the meat packing industry. He is shown here receiving the honor at the November 14 general session of the AMI convention from H. H. Corey (left) of Geo. A. Hormel & Co., who was chairman of the award committee.

The award, consisting of a check for \$1,000 and a gold medal, was made to Rupp for his development of a commercially practicable method of curing bellies by means of multiple-needle pickle injection. In making the presentation, Corey stated in part:

"Of necessity, the committee viewed all entries in the light of certain definite criteria. Did the entry have broad applicability within the industry? Was the entry actually in use on a sufficiently broad scale to have demonstrated its effects? Did the entry have considerable impact upon the industry? . . . We feel that the entry upon which this committee decided has met all the criteria established. It has reduced the curing time of bacon to a point which permits a close correlation between supply and demand. It has minimized inventory problems and made possible greater flexibility in bacon sales and operation. It has reduced financial investment in inventories because of the shorter cure time. It has added to shelf life of sliced bacon by reducing curing time. It has greatly reduced labor in connection with bacon curing, as well as in the maintenance and cleaning of curing equipment. And it has done these things for a substantial portion of the industry."

Rupp has a BS degree from Quincy College, Ill., and an AM degree from Catholic University.

going to get into that. We are discussing mainly the matter of air velocities. Perhaps the two variables in connection with the refrigeration end are most important. They are the temperature of air circulated and the degree of agitation.

First, I would like to mention one thing that stands out in the data which I have uncovered and that is that air circulation seems to help very little if the air temperature is relatively high. In other words, attempting to freeze product at 0 or 2° temperature of air, the rate of freezing through the critical range, which is 31° to 24°, is very little different with contact freezing, still air or blast freezing.

The data on air velocity seem to be rather meager. There are tests, such as Mr. Buehler referred to, which indicate a high velocity, upwards of 3,000 ft., will increase freezing rates.

There are other data which show that increasing the air velocity from 50 to 200 ft. will reduce the time of freezing 45 per cent. Raising the velocity from 50 to 500 ft. will decrease the freezing time 65 per cent, and at the same time, increasing velocity from 50 to 1,500 ft. does not do any better than the 500-ft. velocity.

Those two sets of figures are contradictory. All of us have had some experience in that respect, and I would like to close my comments by stating an opinion that the optimum velocity of air over the product—the actual velocity in the immediate neighborhood of the product or package—is probably between 500 and 800 ft.

MODERATOR NIELSEN: Didn't the last set of figures that you gave deal with a meat product that contained about 20 to 25 per cent fat?

RANSOM: That is right.

NEFF: Wouldn't the horsepower required for the fan be quite an item for the higher speed?

RANSOM: I am sure that it would. Again I have found no data which tie the power input of the fan to refrigeration load alone, but there is no question, as was pointed out by Mr. Buehler, that the energy we put into the air, we must take out by refrigeration.

MACY: Does this point you are talking about refer only to freezing or is it only applicable to chilling?

RANSOM: The data available refer mainly to the hot coolers and I have not included this material in the discussion. We have had some experience in the chilling of trimmings in coolers from an approximate 44° temperature. You can bring them from the trimming room down to 29° and 30°. Our experience in this connection, while our tests are not elaborate, indicates that somewhere between 500 and 1,000 ft. is optimum velocity over the product.

JOHNSON: I think one thing should be pointed out in this connection. Velocity over packaged product is one thing and velocity over unpackaged product another. You have to be careful, especially in low temperature freezing, to avoid freezer burn of meat products.

MODERATOR NIELSEN: Sometimes a partially wrapped product is frozen. It is put in a package and the top is left off.

Let's go to the next question. "What should be the maximum spread between air temperature in a room and the evaporating temperature of the refrigerant?"

WOLCOTT: The spread between the air temperature in a room and the evaporating temperature of the refrigerant in meat industry applications in general should be as small as is consistent with the economical arrangement of the refrigerating equipment for maintaining a particular temperature in a specific cooler. I mean that in hot carcass chill rooms where the average temperature is in the low 30's, say 30 to 32°, a recommended evaporating temperature would be between 10 and 15°, so that the temperature difference would be in the neighborhood of 15 to 20° to maintain the highest degree of relative humidity and the maximum product yield. In processing and 45° sausage package coolers, where a higher temperature is used than in chill coolers, it is recommended that the evaporating temperature be raised by means of back pressure regulating valves so that the temperature difference is still maintained within the range we spoke of previously and we keep our high relative humidity and our minimum shrink. There are exceptions to that rule; for instance, in bacon slicing, hog cutting and pork trimming rooms, where the product temperature is low, it is desirable to maintain a low relative humidity and a low dew point to avoid condensation on product.

MODERATOR NIELSEN: Would you care to comment on the variations there might be in air circulation?

WOLCOTT: Naturally the amount of refrigeration required in removing the heat from a particular operation is dependent on the range of air temperature times the air volume expressed in pounds, and taking into consideration the heat. Therefore, in carcass chill rooms, where there is a large volume of heat to be removed, the circulation in the room might be in the neighborhood of 60 to 100 air changes per hour. In other words, from one to possibly better than one and a half changes per minute.

Frequent air change is not desirable in rooms where product has been previously chilled. It increases the amount of shrink because air circulation and air velocity are factors in picking up moisture from the product. Circulation might be reduced, in most processing coolers, to an air change every five minutes or approximately 12 changes per hour. In some large sales coolers excellent results have been obtained with a ten-minute

air change, or five changes an hour. Circulation cannot be exactly prescribed; what I have given is more or less a guide. Each individual application must be considered before determining the amount of air circulated.

MODERATOR NIELSEN: Is it possible satisfactorily to refrigerate hot carcass coolers without the use of defrosting brine?

PARKER: A great many smaller plants do refrigerate hot carcass coolers with dry coil units and very satisfactorily. Most of these units are of the ceiling-mounted blower type, although within recent months a few installations of fin type ceiling-mounted coils have been made. Ceiling coils do conserve floor space. They cost more to erect, however, and the cost of installing drip pans is higher than with the spray type floor-mounted unit. Dry coil units require about 50 per cent more surface than do spray type coil units and therefore the cost of the unit is greater for equal refrigerating effect.

Saving in cost and avoidance of the inconvenience of maintaining the proper brine or defrosting medium are reasons for using dry coil units. Also, corrosion due to brine carryover is reduced by the use of dry coil units. On the other hand, the time lost in defrosting, which is necessary with dry coil units, is measurable. In some tests that I have made it shows up in the rate of cooling. There is a pause in the cooling rate, particularly in hog chill rooms.

Some years ago I made a test on a 1,200-hog chill room with a large dry coil unit mounted on the ceiling. We had an average coil temperature of 17° and an air temperature of 27°. The return air to the unit was 32°. We picked up 5° in the cooler. This is an average, for conditions varied some within a relatively small range. The lowest relative humidity that we ran into was 95 per cent. The chilling time in this instance was 16 hours and the last hogs in chilled out a little faster than the first hogs in. They were all about the same weight.

In a more recent test in a smaller cooler, equipped with fin type coils, I found that the rate of chilling was approximately the same. The top cooler temperature reached 38°. The lowest temperature in the room was at the beginning of the test and it was 27°; the chilling time was approximately the same.

We are now in the process of testing fin coils in beef coolers. We have found, in using the fin type of coil, that the room seemed to work very vigorously if we maintained a suction pressure below 15°, which is some-

AMI BOARD OF DIRECTORS makes momentous decisions on pork advertising and new methods of trimming pork cuts at their luncheon meeting.



what lower than we like to carry our pressure. Above 15° the room seemed to be a little bit sluggish.

We have also had the problem of defrosting and for

this phase the time varies from 15 minutes to perhaps as long as two hours, depending on the temperature of the air in the room in which the coils are installed.

ACTIVITIES FOR THE WOMEN during the AMI convention are growing in popularity each year. The ladies get-acquainted tea on Saturday afternoon, November 12, was held in the Palmer House and gave the women an opportunity to renew friendships and make new acquaintances over a cup of tea or coffee.

Luncheon at the Sarah Siddons Walk, The Ambassador East Hotel on Monday, November 14, was attended by 125 women. Maggie Daly, Chicago model, presented a commentary and one-woman show on "Fashion is Fun." Wearing a basic suit, she showed the women how to accessorize the suit for morning, noon and evening wear.



In recent years there has been a re-examination of dry coil units and their effect on carcass shrinkage. I wish that I had some information to give you on that question.

I am of the opinion that probably there are other factors more important in product shrink in carcass coolers than the type of unit employed.

My tests have shown that shrink with the spray type units is about the same as with dry coil units. However, this is not in agreement with some of the other published information. Of course, we know the properties of brine and I wonder if Mr. Wolcott would help me out in this respect.

WOLCOTT: Recent tests have indicated that wider spacing in a cooler will cause more shrink than closer spacing of the product. In other words, shrinkage in a partially filled cooler, with the same air circulation, is considerably greater than in a cooler that is filled to capacity.

PARKER: I think that this bears out the information of the other day. Of course, brine spray systems have a reputation for picking up a great deal of moisture in the cooler. I don't know whether I am intruding upon the presentation of someone else, but in my opinion the strength of the brine should be carried only as high as is necessary to keep the coils defrosted.

Mr. Matthews also mentioned in our discussions that it wasn't always necessary to use brine for defrosting, so that the problem of corrosion need not always be present. I think that he has an installation that does not use brine and I wonder if he would care to comment on it.

MATTHEWS: We have one installation in which, instead of using brine, we use another solution and we are able to maintain very high humidity in the cooler.

JOHNSON: Did you not also bring out that the cost of using this solution is no greater than the use of brine?

MATTHEWS: The solution picks up moisture in the cooler and the cost of electricity for removing the moisture, plus the replacement of the substance that is used, is less than the cost of the salt and the corrosion effect within the cooler.

MODERATOR NIELSEN: I would like to jump in here for a moment. We have a question which hinges very closely on this, a question which I was going to assign to Mr. Neff. "What strength brine should be used in refrigerating carcass coolers and to what extent does the strength of the brine affect shrinkage of product?"

NEFF: From the engineering point of view the brine strength should be sufficient so the brine will not freeze

at the evaporator temperature and coat the evaporator surface with ice. Brine is hygroscopic and will tend to shrink products when used in open spray. Of course, the stronger the brine the more it will cause shrinkage. There are theories that product quality requires some shrinkage and the brine strength should be adjusted to what is desired in this respect.

MODERATOR NIELSEN: A very interesting question is: "How can good conditions be maintained in a cooler in low temperature weather and how can serious fluctuations of relative humidity be avoided during the defrosting cycle?" Mr. Joslin.

JOSLIN: Serious fluctuation in coolers can be prevented by dividing the cooling surface or the units into sections, and then defrosting each section separately. The greater the number of cooling sections, the closer can control be maintained on the defrosting cycle.

The question of maintaining proper conditions in the cooler during low temperature weather no doubt has reference to the high humidity which is encountered in wintertime due to the fact that the refrigeration necessary to hold the cooler to proper temperature comes from outside, which sometimes results in condensation on the walls. You can overcome this difficulty by adding sensible heat load, using steam coils or unit heaters. The amount of heat may be controlled by a hygrostat set at the desired relative humidity or manually if greater humidity fluctuations are not objectionable.

MODERATOR NIELSEN: I would like to refer the audience to the papers which have been written which more or less stipulate a desirable relative humidity for the beef carcass coolers of around 85 per cent.

PARKER: In that connection it is necessary to add some heat to the cooler in order to hold the humidity down. Instead of having trouble getting 85 per cent, we got up to 98 per cent and sometimes higher.

MODERATOR NIELSEN: Did you run into slime under that condition?

PARKER: No, we didn't, but we thought we were going to have difficulty so we put heat in the cooler.

MODERATOR NIELSEN: How about such things as the hide curing cellar where you get heavy humidification without even trying?

PARKER: I think the same method would be used. Any method of adding sensible heat which would cause the refrigeration unit to go to work and take moisture out of the air would be the answer to the problem.

MODERATOR NIELSEN: Our next question: "Are there any precautions that have to be observed in the selection and installation of thermostatic expansion valves?" Mr. Matthews.

MATTHEWS: In selecting a thermal expansion valve, three major areas of precaution should be observed: First, selection of the power element; second, the valve sizing, and, third, the type of equalizers selected for the application.

There are three general types of thermostatic charges used in the power elements. First is a liquid charge using the same liquid as the refrigerant. The second is a liquid charge with a liquid different from the refrigerant. The third is a gas charge using the same vapor as the refrigerant. The type selected is based on the application. In other words, if you are using freon you employ one

OFFICERS OF THE AMERICAN MEAT INSTITUTE

J. M. Foster, vice president of merchandising and procurement, John Morrell & Co., Ottumwa, was re-elected chairman of the board of directors of the American Meat Institute, and all other officers and directors whose terms expired this year also were re-elected at the annual meeting.

Wesley Hardenbergh was renamed president; Homer R. Davison and George M. Lewis, vice presidents; H. Harold Meyer of The H. H. Meyer Packing Co., Cincinnati, treasurer, and Roy Stone, secretary and assistant treasurer.

The number of vice chairmen was increased to seven with the election of W. A. Barnette, sr., president of Greenwood Packing Plant, Greenwood, S. C. Vice chairmen re-elected are: A. W. Brickman, Illinois Meat Co., Chicago; John F. Krey, Krey Packing Co., St. Louis; Cornelius C. Noble, Noble's Independent Meat Co., Madera, Calif.; R. A. Rath, The Rath Packing Co., Waterloo; Walter Seiler, Karl Seiler & Sons, Inc., Philadelphia, and W. F. Schluderberg, The Wm. Schluderberg-T. J. Kurdle Co., Baltimore. Barnette also was added to the executive committee of the AMI board, increasing committee membership to 18.

Directors re-elected for terms expiring in 1958 are: Barnette; Foster; Krey; Rath; John H. Bryan, Bryan Brothers Packing Co., West Point, Miss.; G. W. Cook, Emmart Packing Co., Louisville; James D. Cooney, Wilson & Co., Inc., Chicago; Oscar Emge, Emge Packing Co., Inc., Fort Branch, Ind.; Albert Goetze, Albert F. Goetze, Inc., Baltimore; J. B. Hawkins, Lykes Bros., Inc., Tampa; Frank A. Hunter, jr., Hunter Packing Co., East St. Louis, Ill.; A. B. Maurer, Maurer-Neuer, Inc., Kansas City, Kan.; Oscar G. Mayer, Oscar Mayer & Co., Inc., Chicago; A. H. Merkel, Merkel, Inc., Jamaica, N. Y.; L. F. Miles, Peyton Packing Co., El Paso, Tex., and Frederick M. Tobin, Tobin Packing Co., Inc., Rochester, N. Y.

Roy F. Melchior, Agar Packing & Provision Corp., Chicago, was named to fill a board vacancy for the term expiring in 1956.

type; if you use ammonia, you use another type. The operating temperature of the evaporator also affects the selection of the power element.

The ammonia thermal valve should be selected for size so that there is a reasonable balance between the valve capacity and the load, except for low temperature and blower units. In these applications a marked improvement in operation can be effected by using an over-sized valve. Manufacturers of ammonia thermal valves publish ratings of the valves based on 120 to 140 lbs. psi drop across the valve. In ordering a valve for a specific job, it is necessary to use conversion factors to change the ratings of the valves based on the operating liquid and evaporator pressures. Internal equalizers do not operate properly when there is an excessive drop between valve and point where the bulb is located.

Four lbs. psi is considered excessive in evaporators

operating at 0° F. temperature. Two lbs. psi is excessive for lower temperature evaporators. External equalizers are generally used in low temperature blower units and brine and water-chilled units. There is no objection to using external equalizers on any evaporator. The only disadvantage is the slight extra cost of the piping.

In the installation of external equalizers, the connection should be made on the compressor side of the valve bulb to prevent false cooling of the bulb caused by a possible leak in the equalizer line. The location of the bulb is extremely important and in some cases determines the success or failure of the refrigerating plant. External bulbs should be installed on the suction line near the coil surface. The preferred position is on a horizontal run of pipe.

Clean the selected section of pipe thoroughly and, if possible, apply a coat of aluminum paint. It is absolutely necessary to have good contact between the bulb and the pipe in order for the valve to operate properly.

On lines up to 3/4-in. iron pipe size, the bulb is normally located on top of the pipe. On larger lines the bulb is located on the side of the pipe slightly below the center. Avoid locations where the bulb will be tripped, or where the suction return from other evaporators will affect it. If the bulb is affected by ambient temperatures, install the bulb in the usual manner and then insulate the bulb and the line for a distance of approximately 18 in. Another remedy is to use a remote bulb well.

JOHNSON: What are the materials of which the bulbs are made? Stainless steel? Or do you use Monel metal? Or if you don't, do you have much trouble with pretty frequent replacement?

MATTHEWS: The type used in ammonia service is of steel. I am not familiar with the bulb used in other applications.

MODERATOR NIELSEN: Any other comment? This next question concerns construction, which I know has been of interest to quite a few of you lately. Is installation of a ventilated wall finish on cold side of insulation, advisable in all departments? That is, all departments in the meat packing plant. Mr. Macy?

MACY: I think the answer to that question, in the way it is written, would be no. I take it that when we say a ventilated wall we mean an artificially ventilated wall, such as a perforated wall of some type, as opposed to a plastered wall which is ventilated to some extent because it is much less efficient as a vapor barrier than any other type of vapor barrier which you might install on the outside of the insulating material.

Most of the coolers in a packinghouse are subject to cleanup and cleanup people have a customary way of working; they take a high pressure hose and start squirting. I wouldn't want a ventilated wall in a cooler in a packinghouse that suffers that kind of treatment.

In a freezer where the temperature is always below that outside, the vapor travel is always inward and I see no objection to a ventilated wall. However, even there I would want the ventilated part of the wall up some distance above the floor to avoid whatever cleanup there might be in the freezer.

For rooms where vapor travel may be inward and outward during different seasons, a theory has been advanced that the walls should contain vapor barriers inside and out, and the two vapor barriers should be balanced so that during one season the vapor travel in will be equal to the vapor travel outward during the other part of the year. The figures are based on the vapor pressure curve for the locality in which the cooler is situated.

MODERATOR NIELSEN: I have a comment. What about a ventilated wall where you have just freezer storage of packaged products, with a lot of trucking in and out?

MACY: I see no objection to a perforated wall there. In fact, I think it might be very good, especially if you were using an insulation through which moisture could travel very freely so there would be plenty of area exposed for re-evaporation.

MODERATOR NIELSEN: A question which has been submitted asks: "Are there any precautions that must be considered when installing a rotary compressor?"

I would assume that this means a rotary booster compressor, but I don't see any difference between installing a rotary booster and a reciprocating type of booster compressor. You should take the same precautions in either case. Perhaps the most important is that you place a liquid trap in front of a booster compressor of any type. It not only increases the efficiency of the coil, but assures you, provided the trap is designed properly for an estimated 150 ft. per minute or lower gas velocity going through the trap, that you won't get liquid coming back to the compressor.

Most reciprocating machines have relief mechanisms for releasing gas. When liquid slugs cause the mechanism to pop, clouds of ammonia belch forth, and the operator heads for the tall timber. The other thing which I believe is worth considering, particularly when you get down to the temperatures of a booster compressor, is



LEFT: AMI President Wesley Hardenbergh and D. E. Nebergall in a three-sided discussion. John H. Bryan and H. H. Corey hold a South-North conference.

to watch out for the element of superheat in the setup.

One of the reasons why you have a trap in there is to increase the efficiency of the coils. The lower the temperature you have, the harder it is to keep the superheat out. I believe that can be handled easiest by having the

line from the liquid trap to the booster well insulated and with the fewest possible elbows. T's, and fittings.

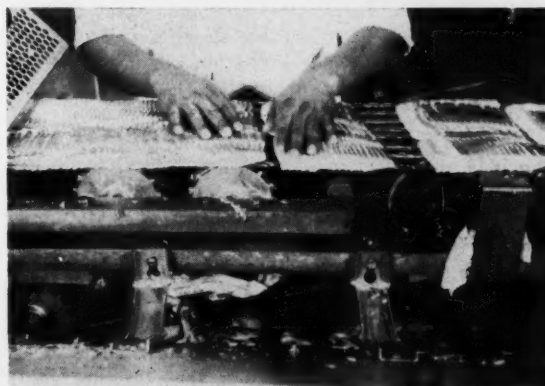
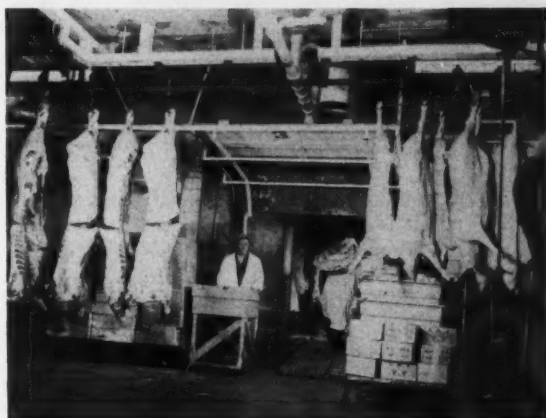
The other feature which is necessary with any booster compressor is to have a proper de-superheater before the gases go into the second stage machines. We find that it

Premier Showing of Institute's New Movie

A brand new full color film, "Three to Get Ready," had its first showing at the convention general session on Tuesday, November 14. The film is the story of a modern mother getting her three children ready for life. Meat is one of the most important foods in her job of making her children healthy and happy. Some of the livestock producing, processing plant, home kitchen and "meat-on-the-job" scenes are shown here.

"Three to Get Ready" is the story of meat as well as the meat packing industry. The importance of the meat packing industry to every American, in its role of making available one of the finest foods on the American table at a service cost which is lower than almost any other food, is graphically illustrated.

Produced by the same studio which developed the Institute's highly successful "This is Life," which has been shown to more than 4,000,000 school children and the vast TV audience, "Three to Get Ready" will be available about January 2, 1956, for purchase or free showings from the Institute's advertising department.



is possible but quite difficult to maintain within 10° of saturation temperature going to a booster as well as to the second stage machine.

Some may argue that a rotary booster compressor has slightly higher discharge gases. We haven't proved that conclusively yet.

NEFF: Do you find the rotary booster sufficiently sturdy, providing you do have dry gas and a suction? Is it a fragile machine?

MODERATOR NIELSEN: I think that depends on the manufacturer.

MACY: I would like to answer on that. We have one and it has had a solution of ammonia that stopped the machine dead.

MODERATOR NIELSEN: Just jammed it?

MACY: It didn't hurt it any.

MODERATOR NIELSEN: Did you have to replace the fins?

MACY: We didn't have to replace anything.

NEFF: If it is sturdy enough for that, it should be sturdy enough for dry gas.

MODERATOR NIELSEN: I would think so. I have heard the comment that you needn't worry about the temperature of the gases until they are up around 150° on the discharge side.

JOHNSON: Mr. Macy, on your rotary booster, do you have a constant load or is it a varying load?

MACY: Pretty constant.

JOHNSON: And you, Mr. Nielsen? Do you have a constant load or is it a varying load?

MODERATOR NIELSEN: I presume you are talking about what happens when you get big fluctuations and are required to recirculate the booster discharge gas to the booster suction in order to give the rotary a variable output? I don't have enough data on it, but I imagine the discharge temperature is going to rise up pretty well. I think an awful lot of that, however, is dependent upon what type of fluctuating loads you have in the plant—whether the fluctuations you are referring to took about an hour to build up, or whether they took about five minutes to build up.

JOHNSON: If I were trying to maintain a certain refrigerant temperature, and the loading was varied, how would you use your rotary booster to do that?

MODERATOR NIELSEN: Providing the load stayed at an in-between state for a long time, we would recirculate. Otherwise we would let it build up a little bit and then shut off the compressor and let the suction pressure vary between 0 and 5 lbs.

MATTHEWS: Or put a back pressure regulator on the evaporator.

PARKER: We have a small booster compressor on a freezer that operates automatically as the pressure goes up to perhaps 10 lbs., and then it will pull down to perhaps 15 in. vacuum and cut out. Then, as the pressure builds up again the machine cuts in; it is fully automatic. However, if our suction pressure should build up much higher than 35 or 40 lbs., which is conceivable if the machine should cut in for any reason with that overload, the booster can get a much higher suction pressure than you might expect. Mr. Wolcott has had some experience with that.

WOLCOTT: In most cases we set the suction of the booster to cut in and out with the mercoid low pressure



PROGRAMS LISTING contention activities are very much in evidence as packers wait for Friday morning meeting.

cutout. In other words, as the booster pumps down to the suction pressure that we have predetermined, the booster stops and, with a rise in suction pressure due to load from the source, the booster automatically comes into operation.

Depending upon the type of rotary booster, the manufacturer does recommend that you don't exceed a certain ratio of compression; that may vary with different manufacturers.

Here is something in which you might be interested. Some kinds of rotary boosters use oil for jacket cooling and they provide a heat exchanger for maintaining the oil at a certain temperature and also the discharge gas oil at a certain temperature.

One question which arises is: "What do you use in the jackets?" I think the latest thought is to plug the jackets and not use anything in them. Water would freeze up. Some have used a glycol solution and circulated it thermostatically or just by gravity. However, I think the latest thought, unless there are some other ideas here, is to plug the jackets on reciprocating boosters and not use any coolant. I would be interested in hearing what the others have to say in that connection.

MATTHEWS: Some manufacturers are putting out machines which use ammonia in the jackets on the high side and you eliminate any trouble that you might encounter through use of water or any other liquid.

MODERATOR NIELSEN: How about plugging the jackets? Does anyone want to comment on that?

MATTHEWS: That is rather dangerous.

MODERATOR NIELSEN: I have another question here which refers to equipment. Can two temperatures be handled by one compressor?

NEFF: I can answer that by saying "yes." Not only can it be done, but it is being done. If you have two temperatures between which the difference is not great, say 10°, then you can properly proportion the evaporator surface for each temperature load.

In case the higher temperature requires critical control for high humidity, it is necessary to use a back pressure valve to hold the temperature close. With some loads, such as a carcass cooler, the temperature varies during the chilling period and a back pressure valve



NEW LEAN TRIM FOR MAJOR PORK CUTS

Streamlined pork cuts, as developed by the Institute provisions committee and approved by the AML board, are shown on left slab in each photo. Lean cuts are made as follows:

SKINNED HAM: Hams are cut from the carcass not less than 2 1/4" or more than 2 3/4" from exposed end of aitch bone. For standard shank hams, saw the closed joint, leaving smooth, hard bone surface on end of the shank bone. Remove collar at a downward slant of 15 to 18 degs. starting from the cushion side. The collar is not more than 45 per cent of the length of the

ham measuring from the tip of the shank to the butt. Skinned hams carry up to a maximum of 1/2" of fat only over the back of the ham from where the skin was removed, except that fat over the back will be beveled down to meet the lean at the butt end. For short shank hams, the shank is sawed off at a point 3" from the wrinkle at the base of the shank.

SKINLESS AND SHANKLESS HAM: The shank is removed by cutting through the stifle joint with a knife. After passing through the stifle joint, the knife is angled to 45 degs. to leave

as much heel as possible on the ham. All skin is removed and the ham fattened down to a uniform covering over the back and along the cushion side not to exceed 1/4" thickness.

BOSTON BUTTS: Fully expose the seam meat. The balance of the butt carries fat covering not to exceed 1/4" and beveled on the edges.

PORK LOINS: Start scribing 1" from edge of chine bone at second rib, scribing on a straight line. Maximum fat thickness 1/4".



could be installed which would hold a constant temperature difference.

Use of one compressor for a variety of temperatures requires quite a bit of study on account of the economic considerations. For instance, 15 lbs. suction pressure will require about 25 per cent more power than 25 lbs. suction pressure, and that is at the 86° condensing temperature, or 155-lb. gauge condensing pressure.

For operating economy each load should be weighed as to whether it would pay to make the initial expenditure for more compressor capacity in order to avoid the later but greater operating expense.

MODERATOR NIELSEN: About what tonnage figure would you say is a breakoff point?

NEFF: I believe you could say 25 tons as long as it is a steady load. If you have a 100 per cent load factor all of the time, it is worth studying whether you need a compressor or part of a compressor. You do not have to have one compressor for a certain pressure; you can split the compressor. The power expense at each location will determine whether it is worthwhile.

MODERATOR NIELSEN: You mentioned back pressure regulating valves. Can shrinkage in a hot carcass cooler be controlled by automatic regulation of the back pressure valve?

MACY: That is something I have never done, but I understand it is being done. It seems to me the problem is where you would mount the sensing elements properly to regulate the back pressure. A chill cooler can be full, half-full or one-quarter full and just where the sensing element should be placed would seem to present quite a problem. However, there are some people here who have actually done it and perhaps they would give me a little help.

JOHNSON: We have run some tests in our work. Locating the regulating device in the room, especially when you don't always load the room to its full capacity, is a problem. We found that in most cases locating a bulb close to the return intake on the units gives us a pretty good average temperature of the air returned to the unit and we get good control within the chill cooler.

WOLCOTT: I might add that while I have not seen back pressure valves used in connection with carcass chill rooms, very often the compensating type back pressure regulator has been used in chilling bacon and

in rooms with variable heat and large variations in refrigerating capacity. In that case the bulb (especially on unit cooler applications) has been installed at the return to the unit.

JOSLIN: How would you manage if you had a number of units in the room?

WOLCOTT: If you have a large variation over a room, with a large number of units, you are at a disadvantage. However, you can pick the one most comparable with the load and have your back pressure regulator on the suction line with all the units.

MODERATOR NIELSEN: I think that we are ready for questions from the floor.

QUESTION: Are there any merits in the manufactured compounds that are put in brine to stop corrosion?

NEFF: I am sure that there are some people who have sufficient faith in them so that they are using them at the present time.

WOLCOTT: I might inject something here that may answer the question. Last year a paper was presented on this subject. It was presented by a corrosion engineer and was the result of over a year's experimental work. This paper is in reprint form. It covers the treatment of sodium chloride brine in meat packing plant refrigeration. It reviews the treatment of this brine for both open and closed systems.

In using open spray refrigeration, both in units and deck work, there has been remarkable progress. I am sure that this paper is available through the Institute.

MODERATOR NIELSEN: I think another thing to consider is that some of these additives to prevent corrosion are definitely toxic and, therefore, you must be careful in using them.

QUESTION: I wonder if Mr. Matthews would care to comment on the use of glycol solutions?

MATTHEWS: The initial charge does cost more. However, over a long period of time we have found that the cost of adding glycol to maintain the strength, the cost of steam or electricity and the maintenance cost of the evaporator total slightly less than the cost of piping brine or trucking salt and using salt solutions.

It also eliminates the need for having to wire brush rails and other metal around a plant.

QUESTION: I wonder if you can tell me specifically whether the cost of freezer burn has actually been determined?

MODERATOR NIELSEN: Would you define "freezer burn?"

QUESTIONER: The product is white on the top, white around the edges and on the inside.

WOLCOTT: I think that it is recognized that freezer burn is surface dehydration and it occurs because the moisture is evaporated, either by the air passing over the product in freezing, or in storage, where the relative humidity in the particular freezer is low and the surface is exposed.

Of course, how to compensate for it is a problem. A lot of companies resort to dipping the product after freezing for storage and/or spraying the product to prevent air contact with the surface. This is done to avoid dehydration and it may be the answer.

MODERATOR NIELSEN: Well, gentlemen, if there are no more questions, that ends our discussion.



LIVESTOCK SESSION speakers included Virgil E. Franz of Swift & Company; Dr. Damon Catron of Iowa State College; Frederick N. Andrews of Purdue University, and U.S. Senator Bourke B. Hickenlooper.

AMI SESSION

SAUSAGE & MERCHAN- DISING

Looking Ahead at Meat Supplies—J. Russell Ives, associate director, department of marketing, American Meat Institute.

Make Sausage Right and Sell It at a Profit—Dr. William J. Shannon, assistant vice president and manager, self-service department, Oscar Mayer & Co., Madison, Wis.

Some Observations about the Sausage Business—Carl Thommen, vice-chairman, AMI committee on sausage, and manager, table-ready meats department, Swift & Company, Chicago.

'56 Meat Production to Expand Slightly



J. R. IVES

• In discussing the outlook this year, I would like to put more emphasis than usual upon some of the long-time trends affecting the meat packing industry, rather than spending all the time trying to give you a better guess than someone else as to how the meat production record will add up when 1956 is all over.

In taking this approach, I am not unmindful of the fact that, whether we like it or not, management does have to make day-to-day judgment decisions which involve numerous short-run forecasts. Nor do I wish to minimize your interest in these short-run supply prospects. I will spend about half of my time on them.

However, it appears to us that one of the really significant developments of the past year in this industry has been its determination to eliminate, insofar as possible, the speculative aspects of its operations . . . to make a profit week by week, whether hog slaughter next March is 5.3, 4.2, or some other figure. Accordingly, it may be worthwhile to examine some of the trends, in addition to supply changes, which also have had a distinct bearing upon the economic outlook for this industry.

Some of the points which I would like to mention are illustrated in the charts and tables.

With respect to the outlook in the 12 months ahead, here are our views, which we have checked as carefully as we could with as many sources as possible:

CATTLE: Taking cattle first, you are aware, I'm sure, that cattle marketings this year have been running slightly above a year ago. Through September commercial cattle slaughter exceeded last year by 3 per cent, with

the increase all in cows and heifers. This could mean that cattle producers have reached the conclusion that some cutback in foundation herds is called for. However, considering the number of young stock on farms and ranches, we're inclined to go along with the view that cow numbers are not likely to show any significant reduction in the January 1, 1956 inventory which will be reported by the USDA next February.

Steer slaughter has totaled slightly under a year ago, and here also it appears that marketings will not be large enough to reduce the steer population as of next January 1.

Some folks have argued that we now are at the point in the cycle where a downturn in cattle numbers should take place. This may be true, but the usual tip-off for such a downturn has not yet appeared. In past cycles, the peak year has been preceded by an increase in marketings of young stock. There has been no such increase in 1955

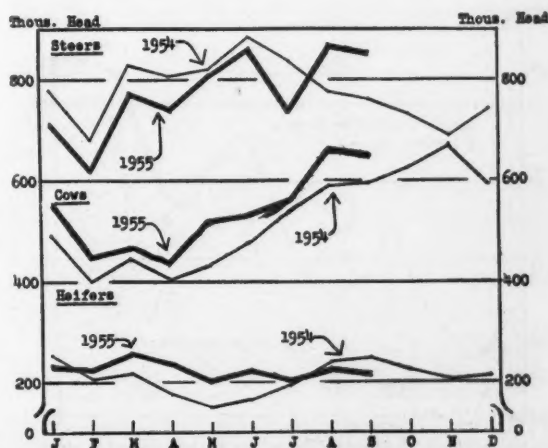


FIGURE 1: F. I. steer, cow and heifer slaughter, 1954-55

(see Figure 1 and 2 and Table 1). Actually, calf slaughter has been running 2 per cent under a year ago. What may be happening is that producers are culling cows closely and are replacing their herds with younger stock.

In any event, it now appears that slaughter of cattle and calves in the current year will total approximately 40,000,000 head, which is 2 per cent above 1954 and will be a new all-time record. Also this is about what it will take to hold cattle numbers steady for the year at around 95,500,000 head.

It should be noted in passing, however, that the USDA will make its regular five-year revision in its livestock population estimates next February, and this may disrupt the arithmetic of these calculations somewhat.

Looking ahead into 1956, there are no strong factors yet evident which will have the effect of either increasing

TABLE 1: TOTAL COMMERCIAL SLAUGHTER AND CLASSIFICATION OF F. I. SLAUGHTER, JANUARY-SEPTEMBER, 1954-55

Class	Thousand Head Jan.-Sept. 1955	Thousand Head Jan.-Sept. 1954	Chg. from Thous. Head	Per Cent
CATTLE				
Federally inspected				
Steers	6,993	7,145	-152	-2
Heifers	2,014	1,833	+181	+10
Cows	4,756	4,342	+414	+10
Bulls and stags	321	356	-35	-10
Total	14,084	13,676	+408	+3
Non-Fed. inspected	5,063	4,870	+193	+4
Total cattle	19,147	18,546	+601	+3
CALVES				
Federally inspected	5,440	5,500	-60	-1
Non-Fed. inspected	3,684	3,818	-134	-4
Total calves	9,124	9,318	-194	-2
TOTAL CATTLE AND CALVES	28,271	27,864	+407	+1

Source: USDA Market News, Livestock Division.

or decreasing total marketings of cattle and calves next year. If this situation holds throughout the year, slaughter in 1956 may be close to the 1955 figure of 40,000,000, which probably would leave cattle numbers relatively unchanged for another year (see Table 2). Although a four-year leveling off period in cattle numbers would be quite unusual, this prospect seems more reasonable than a prediction that producers will cut cattle numbers next year by heavy marketings, merely because a downturn in the cattle cycle appears overdue.

On the cattle feeding situation, as nearly as can be determined from the available figures, the volume of fed cattle marketed this year will be moderately larger than

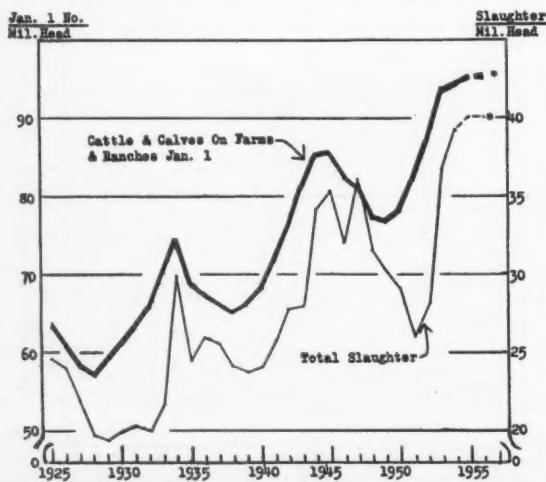


FIGURE 2: Cattle and calf numbers and total slaughter

TABLE 2: BALANCE SHEET OF U. S. CATTLE NUMBERS, 1950-55

Item	1956	1955	1954	1953	1952	1951	1950
Jan. 1 number	95.4*	95.4	94.8	93.6	87.8	82.0	78.0
Calf crop	42.0*	42.2	40.9	38.0	35.7	34.8	34.8
Imports	.4*	.1	.2	.1	.2	.5	.5
Total	137.8*	137.7	134.7	125.9	117.9	117.3	113.3
Calf slaughter	13.2*	13.3	12.3	9.4	8.9	10.5	10.5
Cattle slaughter	26.0	26.0	24.5	18.7	17.1	18.6	18.6
Total slaughter	40.0*	40.0*	39.3	36.8	26.0	29.1	29.1
Death losses	4.1*	4.1	4.1	4.1	3.9	3.7	3.7
Unaccounted for	-1.7*	-1.7	-1.0	+ .1	+ .2	-1.5	-1.5
Total disappearance	42.4*	41.7	39.9	32.3	30.1	31.3	31.3
Number end of year	95.4*	95.4	94.8	93.6	87.8	82.0	82.0

*Preliminary estimates, developed from official figures published by the USDA.

in 1954. However, the marketing pattern has been unusual in that there has been an increase from quarter to quarter in the number of such cattle sent to market. This accounts apparently for the down-trend which has occurred in fat cattle prices during most of the year.

Because prices of finished cattle have not made their usual seasonal advance since last spring, returns from 1954-55 feeding operations have not been particularly favorable, and substantial losses, especially on heavy, prime cattle, have been reported in some cases (see Figure 3). Despite this, the demand for feeder cattle this fall has been relatively strong. For instance, the average price of feeder steers at Kansas City during October was

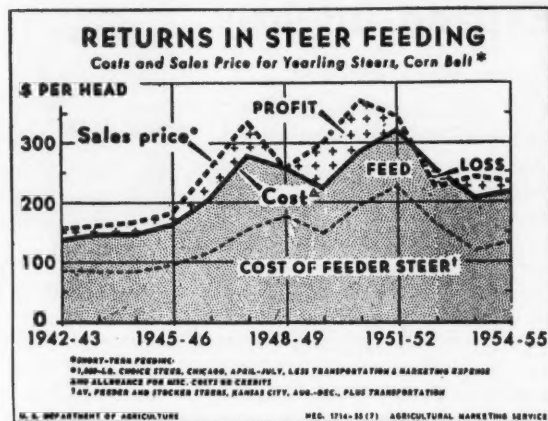


FIGURE 3: Returns in steer feeding, 1942-55

only 85¢ lower than a year earlier, even though market prices for choice steers have averaged \$2 or \$4 below last year at the major markets.

According to the October 1 cattle feeding report, the number of calves on feed in 10 major states was about the same as a year earlier, but the number of cattle weighing 600 to 900 lbs. was 15 per cent larger. Most of these cattle will be headed for the market after the first of the year, so it appears that supplies of finished steers and heifers may be a little larger than a year earlier during the first part of 1956.

SHEEP AND LAMBS: Turning briefly to the outlook for sheep and lambs, it appears very likely that market supplies in 1956 will be somewhat smaller than during 1955. This year's lamb slaughter has been up slightly from last year (see Figure 4) even though the available supply of lambs was about one-half million head smaller. As a result, the tendency to reduce sheep numbers appar-

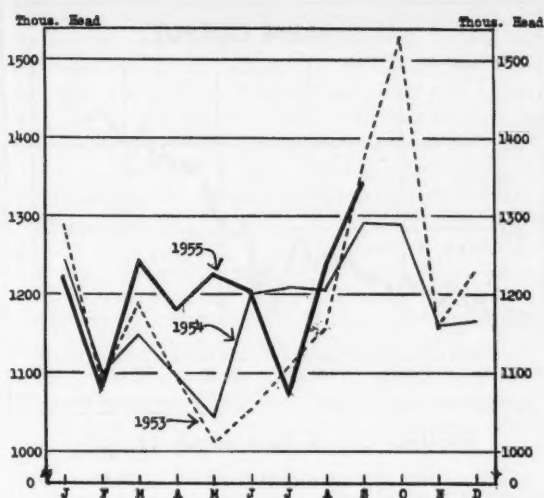


FIGURE 4: F. I. sheep and lamb slaughter, 1953-55

ently has continued during 1955. It is expected that the country's total sheep population as of next January 1 will be about 30,000,000 head, which will be the second smallest number on record.

Next year approximately \$2,000,000 will be available for the promotion of lamb and wool consumption in the United States. This fund is being provided by producers as a deduction from their wool support payments. If this promotional program, plus the new price support program for wool, is successful in strengthening lamb prices, sheep numbers may begin to increase. However, such an expansion can take place only by the holding back of ewe lambs which otherwise would go to market.

HOGS: Now, with respect to hogs, it certainly is not news to anyone in this room that there is a big supply of pork this year. As a matter of fact, federally inspected

TABLE 3: U. S. PIG CROP AND FEDERALLY INSPECTED HOG SLAUGHTER 1953-56 SEASONS

Item	1955	1954	1953	Pct. Chg. From Last Year	Pct. Chg. From 2 Years Ago
Pig Crop					
Spring	60.5	55.6	49.7	+ 9	+22
Fall	40.5 ¹	36.8	31.8	+10	+27
Total	101.0 ¹	92.4	81.5	+ 9	+24
Fed. Insp. Slaughter	53-56	54-55	53-54	Pct. Ch.	Pct. Ch.
August	4.5	3.9	3.4	+16	+32
September	5.1	4.7	4.1	+ 8	+27
October	6.1*	5.2	5.0	+18	+22
November	6.5*	5.8	5.5	+11	+17
Dec.-Jan.	12.4*	11.6	9.9	+ 7	+25
Feb.-Mar.	11.4*	10.1	8.4	+13	+35
April-May	9.7*	8.6	7.2	+12	+34
June-July	7.8*	7.2	6.8	+ 9	+15
Total	63.5*	57.1	50.3	+11	+26

¹Preliminary *A.M.I. Estimates
Source: Developed from official figures published by USDA.

pork production for the year to date is up 13 per cent over 1954. Hog slaughter during each of the past three weeks has exceeded 1,500,000 head, representing an average increase of 23 per cent over last year (see Figure 5).

The increases in marketings this fall were not entirely unexpected, of course. The spring pig crop was estimated to be up 9 per cent over last year, and 22 per cent over 1953. Also, the trend toward early farrowing was recognized. Marketings of barrows and gilts have been fairly well in line with these production estimates by the USDA,

but sow marketings have been larger than was generally anticipated (see Table 4). It is likely that we will see two or three more big weeks before the peak in the fall run is passed. However, by December and January the percentage increases over a year earlier are not expected to be as great as we have had recently.

The question which concerns everyone as much as any is: What about hog runs after the first of the year? You'll recall that the 1955 fall pig crop also was up sharply—+10 per cent for June-August, and +15 per cent for September-November. As nearly as we can figure it, this means a continuing large supply of hogs during the late winter and spring months—perhaps 12 to 13 per cent more than a year earlier during the February-May period.

For the marketing year as a whole—running from last August through next July—we are expecting a federally inspected hog slaughter of about 63,500,000 head, which is an 11 per cent increase over last year. This would be the largest 12-month total since the 1951-52 marketing year.

These large supplies have resulted in a sharp decline in hog prices, and many observers have wondered if a

TABLE 4: SOWS SLAUGHTERED UNDER FEDERAL INSPECTION, 1953-55

Month	1955	1954	1953	Pct. Chg. From 1954	Pct. Chg. From 1953
January	254	179	301	+42	-16
February	190	132	187	+44	+ 2
March	291	191	208	+52	+40
April	376	316	259	+19	+45
May	625	589	448	+ 6	+40
June	1,047	1,167	967	-10	+ 8
July	1,028	1,028	986	same	+ 4
August	940	747	693	+26	+36
September	597	417	394	+43	+52
October	400*	305	310	+31	+29
November	400*	339	283	+18	+41
December	400*	337	275	+19	+45
Total	6,548*	5,747	5,311	+14	+23

*Estimates based on USDA information.

substantial cutback in production might take place in 1956. The little bit of evidence we have thus far indicates that this is not happening. According to the USDA quarterly pig crop report, which was inaugurated last year, breeding intentions in nine major states for the December-February period are down only 2 per cent. Several observers are anticipating very little change in the total 1956 spring crop. They base their predictions on the fact that even at recent relatively low prices, the hog-

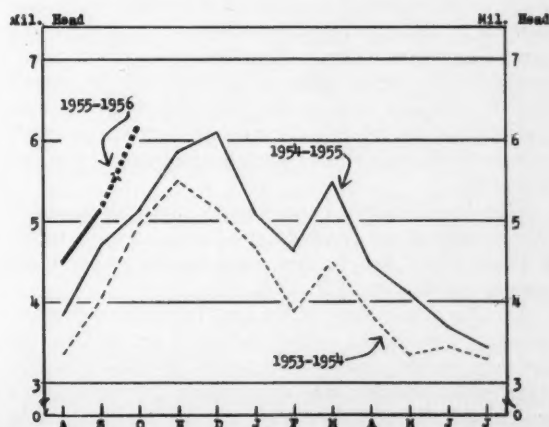


FIGURE 5: Federally inspected hog kill, 1953-56

corn price ratio has been about as favorable as last fall, plus the fact that hog producers who are not eligible for corn loans still find hogs the best market for their corn. We'll know more about the outlook for 1956 hog production when the December pig crop report is released in about five weeks.

Now, to put these pieces together, we are estimating that meat production in 1956 will expand a little further

TABLE 5: U. S. MEAT PRODUCTION AND PER CAPITA CONSUMPTION 1954-56

Item	1956 Prospects	1955 Prelim.	1954	1956 Ch. 1955 Pct.	From 1954 Pct.
Total Production	13,450*	13,550*	12,991	-1	+4
Beef	1,600*	1,600*	1,656	same	-3
Veal	700*	750*	734	-7	-5
Lamb & Mutton	11,450*	10,950*	9,952	+5	+15
Pork	27,200*	26,850*	25,333	+1	+7
Per Capita Consumption					
Beef	79.4*	80.8*	79.2	-2	small +
Veal	9.4*	9.5*	9.9	-1	-5
Lamb & Mutton	4.2*	4.5*	4.5	-7	-7
Pork	67.0*	65.7*	59.7	+2	+12
Total	160.0*	160.5*	153.3	small -	+4

*Estimates of A.M.I.

to a total of approximately 27,200,000,000 lbs (see Table 5). This would be slightly above the 1955 record meat production of 26,800,000,000 lbs. The anticipated expansion in the pork volume during the first half of 1956 accounts for all of the gain. Because the population continues to increase, per capita meat consumption in 1956 may decrease slightly from this year's approximately 161 lbs. per person. However, this still will be the third largest meat consumption level on record.

Thus far I've said very little relating directly to sausage. If you haven't been following the figures, I think

TABLE 6: SAUSAGE PRODUCTION UNDER FEDERAL INSPECTION, 1940-55

Year	Fresh Finished	Wieners & Franks	Other Sm./Cooked	Dry or Semi-Dry	Loaves etc.	Total
1940	137	599	121	121		978
1941	148	642	124	142		1057
1942	200	812	119	182		1313
1943	391	985	145	241		1763
1944	416	1030	142	209		1798
1945	479	1101	136	250		1966
1946	316	974	109	208		1607
1947	247	1019	137	191		1594
1948	232	932	109	184		1457
1949	238	965	116	175		1493
1950	192	461	501	123	184	1461
1951	215	495	553	114	193	1570
1952	220	524	593	119	196	1652
1953	204	543	609	124	195	1675
1954	208	567	617	129	197	1718
1955 Prel.*	230	610	620	135	205	1800

you'll be interested in knowing that sausage production thus far in 1955 has been about 5 per cent above a year ago. The year's output of federally inspected plants probably will reach a figure of 1,800,000,000 lbs., which will be exceeded only by the war-year figure of over 1,900,000,00 lbs. in 1945. About one-third of this year's sausage production will be wieners and frankfurters (see Table 6).

With abundant supplies of sausage materials available next year, plus the growing appeal of table-ready foods, it seems likely that further gains are in prospect for sausage manufacturers in 1956.

Turning now to some of the long range developments, as a first point in this overall picture of trends affecting the meat packing industry, we might note the fact that tremendous changes are taking place in our nation's agriculture. It even has been referred to by some as "agriculture's technological revolution." To paraphrase

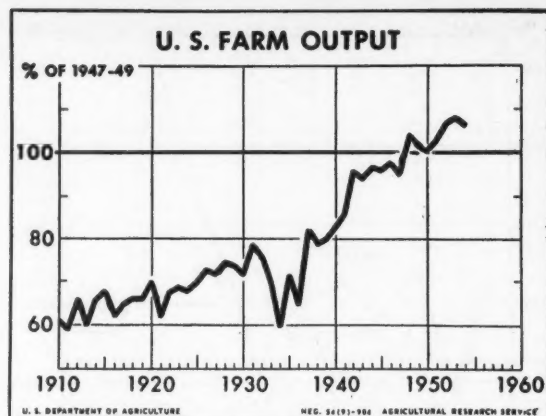


FIGURE 6: U. S. farm output, 1910-55

Winston Churchill, never in history have so few been able to produce so much food for so many.

Despite rather poor weather conditions in some areas, total agricultural production this year may establish a new all-time record, which will exceed the pre-world war level by some 30 per cent (see Figure 6). Our population has increased by about 25 per cent in this 15-year period.

The important thing to note, however, is that agriculture's capacity to produce, principally through increased application of technology, has mounted more rapidly than the demand for food and fiber. Considering the large volume of research that is going on in agriculture, plus the fact that potential yields of both crops and livestock are known to be well above the production rate for most farmers, this propensity to over-produce seems likely to continue for several more years.

If this outlook is correct, as most agricultural economists believe it is, it holds many implications, both economic and political, for food processing industries. One of these is the probable close scrutiny, from time to time, of food processing and distribution costs by governmental agencies.

LONG-TERM TRENDS: Coming down more specifically to that part of agriculture which supplies the meat industry with its raw materials, the long-run trends appear to be these:

(a) With potential feed supplies (see Table 7) imposing no lid on future livestock production, the farm

TABLE 7: SUPPLY AND DISAPPEARANCE OF FEED GRAINS UNITED STATES, CROP MARKETING YEAR, 1952-55

Item	Crop Year Beginning 1955 ¹	1954 ²	1953	October 1 1952	1955 Pct. Change '54
Supply					
Carryover					
Under price	29.5	23.0	16.7	9.0	+28
Other stocks	10.0	8.8	10.3	11.2	+14
Total	39.5	31.8	27.0	20.2	+24
Production					
Corn	87.3	83.0	89.4	91.8	+5
Oats	26.2	24.0	19.3	20.2	+9
Barley	9.3	8.9	5.8	5.4	+4
Sorghum grains	4.4	5.7	3.1	2.3	+12
Total	127.2	121.6	117.6	119.7	+6
Imports	.8	.9	2.2	1.7	-11
Total supply	169.5	154.3	146.8	141.6	+10
Distribution					
Livestock feed	105.0*	97.1	98.9	97.4	+8
Food, industry, and seed	14.0*	12.8	12.6	12.0	+9
Exports	5.3*	4.9	3.5	5.2	+8
Total	124.3*	114.8	115.0	114.6	+8
Carryover at end of year	45.2*	39.5	31.8	27.0	+14

¹Preliminary estimates based on October 1 indications.

²Preliminary.

*A.M.I. estimates. Source: The Feed Situation, USDA.

and ranch output of meat animals could very well match the upward trend in population. However, federal farm programs which may reduce, or divert feed to dead storage, plus the growing shortage and high cost of farm labor, are factors that could get in the way of an expansion in livestock raising in the years ahead.

(b) In the case of cattle, there are indications that the country is a long way from reaching its maximum carrying capacity for breeding herds. Regardless of what specific farm program may be adopted, it seems likely that more and more emphasis will be given to soil conserving crops such as hay and pasture. Research has shown that the beef production potential of these crops is very large. This can, and probably will, mean more small cattle herds in the major cropping areas of the Midwest and the Southeast. Range improvement programs in the West also are increasing carrying capacity in these states.

One estimate we have seen is that cattle numbers will decline during the next few years and then swing upward again to a figure of 106,000,000 head by 1965.

Our own guess is that while cattle numbers may decline sometime within the next three or four years, the downturn will not be as pronounced as in past cycles when reserve feed supplies were not so abundant and when the cattle industry was not as sound financially as at present. This assumes no really serious droughts, of course.

(c) Cattle feeding also is in an expansion phase. Such figures as we have seen indicate that commercial feeding is growing in importance, relative to farm feed lots, particularly in the West. This trend has been stimulated, no doubt, by the adoption of such new feeding practices as the use of stilbestrol, and the introduction of labor saving devices, both of which place increased emphasis on skilled management in feeding cattle.

(d) Sheep production is largely a questionmark. The USDA program to support wool prices, and the accompanying program to promote lamb and wool with domestic consumers, could provide considerable stimulus to production, particularly in farm flocks. It is unlikely, however, that production will return to pre-war levels during the next few years.

(e) Hog production, which historically has been largely a process of converting corn into pork, is under-

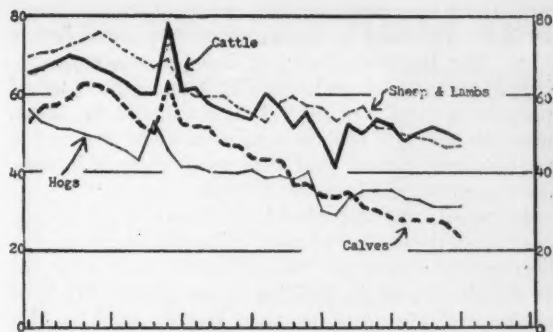


FIGURE 8: Comparison of local slaughter at public stockyards with total commercial slaughter.

going rather spectacular changes involving both efficiency of production and type of hogs raised. A rough measure of these developments is the rise in the number of pigs saved per litter—from 5.7 in the late 20's to 6.8 during the past two years. Also, the average age at which hogs are marketed has been shortened by several weeks. Time of farrowing and time of marketing have tended to be earlier, thereby leveling out somewhat the seasonal swings in hog supplies (see Figure 7). While there still is a long way to go on this, more and more commercial hog raisers are thinking in terms of multiple farrowings, rather than just one or two pig crops a year. Here again, our scientists and our research in animal husbandry are well ahead of the average producer in developing the hog raising practices of the future.

Also on the production side is the mounting interest in the meat-type hog. We can only guess at the number now being raised, but it probably is somewhat around the 10 or 15 per cent level. Even my dentist, whom I visited last week, tells me that he has gone to meat-type hogs on his farm a few miles west of Chicago. As more breeding stock is developed, it now seems certain that production of these meatier hogs will expand further.

As a third point we might touch briefly on trends in livestock marketing. In this connection we can't help noticing the downward drift in the proportion of all livestock moving through central markets (see Figure 8). For instance, during the first nine months of this year cattle purchased for slaughter at public stockyards represented 48 per cent of all cattle slaughtered in commercial establishments. In 1950 the figure was 52 per cent and 20 years before that it was 64 per cent. This trend, which also is apparent for calves, lambs and hogs, is explained by the continued growth in truck transportation, traffic congestion in many market areas, and other factors which have had a bearing upon plant location.

Another facet of livestock marketing is the rapidly growing interest on the part of packers and producers alike in refinements which are being made in hog buying practices so as to better reflect product values for individual hogs. This subject was discussed on the livestock program yesterday afternoon, and we know of several companies which have "broken through the sound barrier" so to speak, in modernizing their hog buying programs. It appears that hog buying on a merit basis will receive every opportunity to prove itself in the future.

As Point 4 I'd like to mention some of the changes

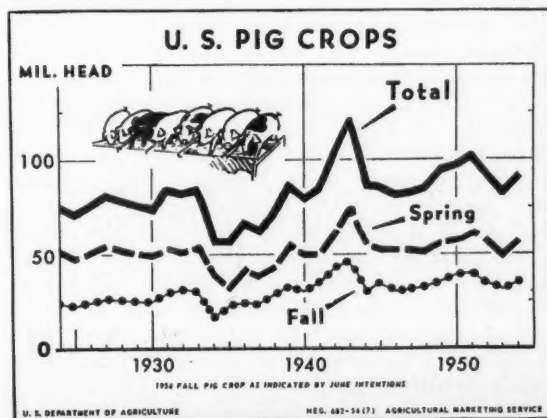


FIGURE 7: U. S. pig crops, 1925-1954

which have been going on within the meat packing industry itself. Foremost, of course, are the rapidly mounting costs. The Institute's survey of financial results for the industry shows that total operating expenses were up 37 per cent in 1954 over 1949. Wages and salaries, which make up fully half of these costs, were up 39 per cent in this five-year period, and they most likely will show another substantial increase this year.

Despite the industry's low level of earnings, it is curious to note the number of new facilities which are coming into operation each year, through remodeling, additions to old plants, and the building of new plants. We have no way of measuring, or even keeping track of this growth. However, a hasty check of trade publications for the past 12 months shows a count of some 130 new plants being opened or built, plus approximately 40 remodeling jobs which also added capacity to existing

federally inspection production this year (see Table 9).

(e) Increased competition from poultry; per capita consumption of poultry meat in 1955 will be about 27 lbs., compared with 17 lbs. in 1940.

(f) More beef is being federally graded; about 46 per cent of the total commercial production this year compared with 25 per cent in 1950 and 8 per cent pre-war.

(g) More packaging is done under private brands. There are no figures on this, but it is well known that it has grown substantially.

(h) New developments have come in frozen meats. There must be at least 100 firms packaging frozen meats of one kind or another today.

The point is that there are a lot of things going on. This certainly is not a static industry.

As *Point 5* we might touch briefly on the merchandising side of the meat packing business. One of the remarkable trends of our times is the tremendous growth of the supermarket. Here are just a few points which seem worth noting:

From such historical data as are available, it is estimated that supermarket sales in 1954 were about 2½ times their 1947 volume. At the same time total grocery store sales were up only 60 per cent in this period. Also, according to the Super Market Institute, about half of the supermarkets are only five years old, and for every 10 markets in operation as of January 1, 1955, three new ones were being planned.

Self-service meat counters are the rule in these stores. It is estimated that approximately one-third of all meat sold at retail during 1954 was self-service. This represents a growth from practically no self-service in 1947, and it appears fairly certain that the trend is continuing.

According to another set of estimates developed by the magazine *Progressive Grocer*, supermarkets (both chain and independents) did 53 per cent of the country's grocery store business in 1954 . . . superettes did about 29 per cent, and small stores, which are almost entirely independents, did less than 18 per cent of the business. This all indicates that the industry's customers are declining in total number, while at the same time some are getting larger.

As a *sixth* and final point we should not overlook Mrs. Consumer, who represents the ultimate purchaser of most meat products. Although the population of the country has continued to grow at a rate of 2,500,000 persons per year, and business in general has expanded rapidly in the post-war period, we find that the demand for meat does not necessarily correlate well with such factors.

For instance, as a rough measure of this situation, the retail value of all meat consumed in 1955 will be about 25 per cent greater than in 1947. But in the same period, the total amount of money consumers have to spend, what the economist calls "personal disposable income," has gone up about 60 per cent. Looking at this picture a little closer, we note also that in the past nine years the proportion of disposable income spent for beef has remained fairly constant at around 2.8 per cent. But in the case of pork there has been a steady downward trend in this percentage from 3.0 per cent in 1947 to 2.0 per cent in the current year.

Obviously this slide-off in the percentage of consumer income going for pork has meant materially lower prices

TABLE 8: CANNED MEAT PRODUCTION UNDER FEDERAL INSPECTION, 1940-55

Year	Beef	Pork	Sausage	Other	Total
1940	80	282	37	131	530
1941	107	463	93	227	890
1942	158	978	285	506	1927
1943	109	1212	240	490	2051
1944	187	885	229	630	1931
1945	248	851	152	655	1926
1946	146	644	70	483	1343
1947	136	448	118	397	1099
Year	Luncheon Meat	Canned Hams	Vienna Sausage	All Other	Total
1948	311	109	60	616	1096
1949	315	137	58	530	1040
1950	347	171	54	459	1231
1951	340	183	52	866	1441
1952	352	206	47	747	1351
1953	314	196	51	877	1438
1954	320	203	59	859	1441
1955 Prel.*	280	210	60	925	1475

Source: Official U. S. Government Sources. *AMI estimate.

facilities. There also were some plants closed during the past year, but the net capacity of the industry apparently is keeping pace with our livestock production.

Other trends, not necessarily all of which are favorable, but which are significant, would make a long list:

(a) Increased sausage production; output is up 5 per cent over last year, and nearly 25 per cent larger than in 1950 (see Table 7).

(b) Increased slicing of bacon; now probably somewhere around 70 per cent of all bacon bellies as against 35 per cent pre-war.

(c) More hams being canned; production of canned hams has doubled since 1948 and now represents about

TABLE 9: FEDERALLY INSPECTED LARD PRODUCTION AND USE IN MANUFACTURING, 1940-55

Year	Fed. Insp. Production	Exports & Shipments	Million Pounds Used in Mfg.	Percentage Exported	Percentage Used in Mfg.
1940	1577	232	23	15.2	1.5
1941	1526	424	59	27.8	3.9
1942	1724	685	71	39.7	4.1
1943	2080	796	141	38.3	6.8
1944	2367	938	241	39.6	10.2
1945	1311	672	112	51.3	8.5
1946	1344	490	24	36.5	1.8
1947	1722	417	111	24.2	6.4
1948	1680	327	122	19.5	7.3
1949	1923	657	147	34.7	7.4
1950	2009	523	206	26.0	10.3
1951	2225	743	247	33.4	11.1
1952	2234	694	262	31.1	11.7
1953	1812	476	238	26.3	13.1
1954	1831	521	149	28.5	8.1
1955 Prel.*	2100	650	375	31.0	17.9

Source: Official U. S. Government Sources. *AMI estimate.

15 per cent of all federally inspected hams (see Table 8).

(d) More lard going into manufacturing uses; possibly as much as 375,000,000 lbs., or 18 per cent of the

for pork products and for live hogs than would be true if there had been no such decline. The Institute's provisions committee has been studying this situation during the past year, and has recommended a closer trim for pork products as one means of improving consumer demand for pork. (See page 153 for pictures of the "new trim" pork cuts.)

No one knows for sure what all enters into Mrs. Housewife's decisions at the meat counter. There are some clues, however, and it is hoped that they can be developed into solid information which can be put to work in the interest of a stronger demand for meat products. For instance, a recent study indicates that most meat buying decisions are not made in advance, but they are arrived at largely in the store. Also, a pilot study which the Institute has made, indicates that approximately one-third of the meals which are prepared in the home are of the snack variety, involving no cooking other than making coffee. Similarly the popularity of such food items as cake mixes and TV dinners indicates that there is a strong willingness, on the part of consumers, to pay for additional processing which will shorten the time which must be spent in the kitchen in the preparation of meals.

Another factor which is suspected, even though it cannot be proved, is that an increased share of consumers' incomes are "tied up" in the form of house payments

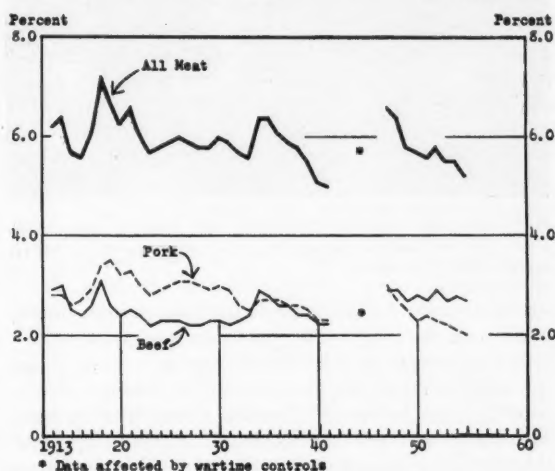


FIGURE 10: Retail value of meat consumed as a percent of disposable income, 1913-55.

and other installment buying, which may affect the amount of money left in the family food budget when Mrs. Housewife goes to the retail store to make her purchases of meat.

These and other similar observations all point to the fact that buying patterns for meat may have changed considerably in recent years. It is an aspect of the meat business which probably needs closer attention in evaluating meat's competition for a share of the consumer's dollar.

I am not predicting that these trends necessarily will continue indefinitely. However, they are all factors which have had considerable bearing on the meat packing industry in this post-war period. It behooves us, I think, to keep a close eye on them in the future.

Make Sausage Right and Sell at Profit



DR. SHANNON

• I actually have two subjects to review. First, "Making Sausage Right" and second, "Selling This Sausage at a Profit." If all sausage were being made correctly today, and if it were being sold profitably, I would not be on this morning's

program, so let us be honest about the problem and face the facts. I would like to stress that I am not condemning the American sausage industry.

I recognize as you do that for many years certain companies have turned out a consistently high quality product without question. My comments refer, however, to the general industry as such.

If we will consider the history of sausage manufacturing in the United States during the period of 1930 through 1945, I think we will all agree that the consumer was quite right in being skeptical about much of the product that was being offered for sale in this country. The methods of operation were primarily hit and miss.

There was a lack of processing control and frequently questionable raw materials were used. It may have been that the use of this questionable raw material was based on ignorance on the part of management; however, sausage frequently was poorly made and handled. During the period, there was a general lack of adequate refrigeration as we know it today, and this lack of refrigeration definitely down-graded the existing product. The lack of refrigeration was in our own plants as well as in the retail stores where our products were being offered for sale.

As late as 1946 a sausage maker demanded a rather high level of pay as compared to other workers in the industry. In many companies sausage making was an art and the secrets of that art were carefully guarded by the head sausage maker, who conducted his various operations in an extremely secretive manner. The sausage maker was definitely proud of his knowledge and was suspicious of anyone that inquired too thoroughly into his formulations and practices. So much for the history of the sausage industry.

Now, let us concern ourselves with a modern sausage manufacturing operation as we know it today. As I have frequently said to members of our own company, we have a *food processing plant*, and, if we are to be successful, we must take advantage of modern facilities and technical knowledge. Good sausage can be made only from good raw material. The quality of raw material from the standpoint of moisture, fat and protein must be known and controlled.

Equally important is the bacteriological picture of raw material. The bacteriological picture is a reflection of general plant sanitation, type of refrigeration and age of the raw material. In addition to the bacteriological problem, we must consider the chemical side of deterioration of the unprocessed raw materials. By this I mean the breakdown of fat in pork trimmings and the alteration of the protein of the cow meat. It is impossible to

manufacture a quality wiener, as an example, from pork trimmings that possess a definite degree of rancidity.

In a well-controlled operation it also is important to know the chemical analysis of the finished product. This is our means of controlling our shrinkage, complying with federal and state laws and checking the accuracy of formulation.

Now that we have the proper raw material, let us turn our attention to the operating procedure within the plant. Every operation from grinding through chopping, stuffing, smoking and cooking can be brought under technical measurement and control. The successful sausage operation follows a rigid operating specification which carefully spells out raw material usage, temperature of raw material, temperature and time in the chopping or grinding operation, maximum and minimum time between stuffing and smokehouse, and a rigid control of smokehouse temperature, relative humidity and time of process.

You may say that your small operation cannot afford such degree of control. You may feel also that your head sausage maker knows all these things by rule of thumb and that it is not necessary to use time clock, chemical analysis and thermometer in your operation. You may, indeed, be fortunate enough to have a sausage maker who can consistently produce to your qualifications and specification level. However, such cases are indeed rare when honestly appraised.

Every plant should have a detailed written specification on all its sausage operations as a matter of good insurance against the untimely passing of the expert sausage maker, if for no other reason. These operating procedures need not be elaborate, but they should be in enough detail so that day after day various operators can continue to produce to the desired level of quality. In the modern sausage operation there is no place for the sausage maker who has that mysterious talent of converting sticky, old or rancid raw material into a supposedly edible product.

Following the manufacturing, it is necessary to consider the problem of packaging and of identifying the produced product to the consumer. It is important to remember that packaging a product carefully, and in some cases elaborately, does not improve the basic quality

of the product that was placed in the package. The package is only a means of protecting the product until it reaches the consumer and, of course, in today's market, in addition to protecting the product, it also must have a merchandising value to impel buying in self-service markets.

It is our feeling that the producer of good sausage should identify his product to the consumer. It is only human nature to desire to make a better product when your name appears on it. Oscar Mayer & Co. has pioneered in this practice, and we are proud to say that it has been the correct approach in the building of our sound sausage business.

The next point to consider is the quality level that your company desires to produce. Quality in itself is a relative term and has to be more carefully defined.

Our company has decided that Oscar Mayer & Co. quality level is the best possible sausage that we can con-



GREETING OLD ACQUAINTANCES and meeting new friends seem to be the order of the day as packers and suppliers gather for another AML convention.

sistently produce. We have found that a high quality product in the long run brings us the greatest return.

It is important in discussing quality to remember that the quality you decide upon should be maintained consistently. We frequently pick up competitors' product for analysis and general checking. It is gratifying to see the general improvement that has taken place in sausage quality during the past few years. Our business as well as yours will increase as sausage finds its place on the American dinner table as well as in the lunch box.

The next point in our modern sausage operation is a careful evaluation of labor so that we can produce the desired product and still be competitive from the labor cost standpoint. We also have endeavored in all our plants to retain the pride of workmanship which is so extremely important in today's competitive industries.

Let us now consider the future operations of making sausage right. I think we all agree that the first point is to continue to improve the overall quality of our line. This improvement will come as the result of taking advantage of technical knowledge in the selection and handling of raw material, operating procedures, improvement in refrigeration and distribution of the finished product.

The future demands that our product be packaged



"IN RIGHT THIS WAY, for the meat industry's biggest show," says the Andy Fraim usher at the door.

for the growing self-service market requirements. We as sausage makers now are faced with a very critical problem. Shall we manufacture and pack our product within our own establishment in the final consumer package, or shall we become suppliers of bulk sausage to be sliced in the large retail outlets? Oscar Mayer & Co. always has felt that the sausage industry can serve the retail as well as the consuming public better by completely packaging its various sausage items.

The well-planned operation which takes advantage of raw material selection, continuous operations and improved sanitation should make better products at a lower price for the retail dealer as well as the consumer. This change already has taken place in other food fields such as the milling industry. Do not believe for a moment that new radioactive sterilization will solve all your problems in the manufacture of good sausage. The good sausage must first be made before we can be concerned with keeping it, and as we say in our company, "We make the product to sell it and not to keep it."

The second portion of this discussion deals with selling good sausage at a profit. For management executives to plan their sales correctly, it is necessary that they have an accurate analysis of their total costs, including manufacturing, plant overhead, sales and delivery expenses. They also must know the margin that they need in order to operate a profitable business. Therefore, the cost accounting department has to supply up-to-date information that will aid management in planning ahead. This is in addition to its normal function of telling management why the firm has been in the red.

Our company has followed the procedure of setting definite sales budgets which make it possible for our operating division to plan its production schedule in the most efficient manner. Because the quality of our sausage items remains consistently high, our sales department has confidence in the product that it is selling. By experience the salesmen have found that their calls are not wasted discussing claims of faulty product with their accounts. Their valuable sales time is used to sell the next order.

We frequently have been asked how we control our selling prices. In our company all salesmen sell against a firm price list. The price policy is set by top management and all sales personnel must comply. The Oscar Mayer & Co. sales routes are carefully checked at frequent intervals for price list adherence.

Our company does not believe in the consignment of



HUNGRY HORDE leaves the meeting hall in search of food.

product or guaranteed sales of the new self-service items. The old story of making a sale merely because it contributes to overhead is no longer accepted. We have tried to stress the importance of selling our product for what it is worth and selling it at a definite profit on each and every sale.

In our sales training programs we tell our salesmen that they always will be the highest men on the street and, therefore, not to be concerned about the low price their competitors may have because our competitors know better than we what their product is worth. When all you have to sell is price, you always will find someone who can undersell you, if not this week, certainly next week.

The next important point in selling sausage correctly and profitably is to take your story to Mrs. Consumer. You may say that you are too small for an advertising budget. That may be true, but if you will consider that every pound of your product that enters the consumer's home with your name proudly displayed on the package is the best possible type of advertising, then your advertising program already is underway.

We always have tried in the development of the product to satisfy a consumer need or desire. We pay close attention to the consumers' likes and dislikes, and our active salesmen recognize our concern and keep us well informed on the customers' requirements.

In closing I would like to quote from a talk delivered by G. O. Mayer of our organization to the provisions committee meeting of the American Meat Institute:

"Any one company is to a considerable extent tied, in its financial results, to the performance of the industry. Only if the industry is healthy and profitable and takes its rightful place among the more successful industries of our great nation can we as individual companies truly prosper. Our future lies in keeping our plants modern, in achieving high efficiency and productivity, and in constantly improving our products and their presentation. These can preferably be attained, at least in part, through the reinvestment of earnings obtained from profitable merchandising and selling. The packers who will prosper are not those who make volume their primary goal, who use volume to cut costs, who use price to get volume, who will make a sale to get a contribution to overhead, who rely unduly on speculation possibilities—but rather those who make profit their current and primary objective."



LADIES ON THE MOVE to the Monday afternoon fashion show.

Sausage Future Hitched To Quality

• I am pleased to have this opportunity to talk to you about the activities of the American Meat Institute sausage committee, to say something about the research on sausage being conducted by the American Meat Institute Foundation and also to make a few observations about the marketing of sausage products.

The sausage industry is a very large industry and a very important one. This industry has made great strides over the years and we have great opportunities to continue to grow, provided we do the right things and eliminate some of the bad things.

During the past year Herbert Rumsey, jr., Tobin Packing Co., Rochester, N. Y., served as chairman of the American Meat Institute sausage committee. We are grateful to him for his fine work and his active leadership. Even though he has retired from the chairmanship of the sausage committee, we are sure he will continue to be an active member. The present membership of the sausage committee consists of representatives of 35 meat packing companies and sausage manufacturers of all sizes, large and small, and located throughout the country.

The committee meets three or four times a year, depending upon the nature of the problems on the agenda of the committee and the urgency of their being resolved.

One of the subjects that the committee gives consideration to is the change in regulations promulgated from time to time by the federal government, states and municipalities, that affect sausage and meat specialties. Every year several states attempt to promulgate new laws and regulations that affect sausage products, either in the use of certain ingredients in sausage formulas or in labeling procedures, and frequently these proposed changes, if enacted, would adversely affect the sausage business. In some cases, if the laws were passed, they would restrict or hinder the shipment of these products interstate.

When these proposed changes are called to the attention of the Institute, they are reviewed by the sausage committee, and the members in the states where the proposals are under consideration are notified. Frequently the proposals either are not put into effect or, in some cases, the undesirable provisions of the proposals are changed.

The Institute also issues an annual summary of all federal and state regulations affecting sausage products. Copies of this compilation are made available to all members of the Institute.

The sausage committee counsels with the Institute concerning the sausage advertising promotion programs that are conducted from year to year.

The sausage committee has been very active during the past three years working with the Institute's technical advisory committee on moisture in sausage, on some basic research regarding a more accurate and practical



C. THOMMEN

formula for moisture determination in sausage than the present method of determination used by the Meat Inspection Branch of the USDA and other regulatory agencies. These Institute committees have had several constructive conferences with MIB officials during the past two years in connection with this subject, and it is hoped that eventually a satisfactory solution of the problem can be found.

The Institute and the American Meat Institute Foundation also have recently entered into a cooperative research project with the Meat Inspection Branch of the USDA to determine analytical error in meat protein analysis. This cooperative project involves the furnishing of samples of bologna by the Foundation to more than 50 chemical laboratories throughout the country, including laboratories operated by individual meat packing companies and also laboratories operated by the Meat Inspection Branch of the USDA. The results of this comprehensive research project will be summarized shortly by the AMIF and will be made available to the industry.

Membership in the sausage committee is open to all Institute members. All you need to become a member is to show your interest in industry problems by attending sausage committee meetings regularly or as often as you can. We would like very much to see the sausage committee membership enlarged to include a representative from each company.

The demand for scientific and technical advances related to the manufacture, packaging and distribution of our products continues. The persistent trend towards pre-sliced and prepackaged products and toward self-service has imposed serious manufacturing and packaging problems, especially as they relate to the maintenance of product quality throughout the distributive process. Costs being what they are, there has been continuous pressure also for improved processes and avoidance of processing failures or other expensive failures in connection with product.

In these connections, I have been very much interested in and impressed with the research program of the American Meat Institute Foundation. It merits mention that the Foundation, from the viewpoint of corporate identity or financing, is not a part of any other organization. It was established, however, under the sponsor-



EXHIBITORS TEAR DOWN and pack up their displays after show.

ship of the American Meat Institute and its member companies and devotes its attention exclusively to scientific research and education in fields directly related to our products.

It collaborates closely with the Institute and the University of Chicago and has become one of the outstanding centers of scientific research. Most of the companies represented in this room contribute to its research funds, and these contributions in the aggregate enable the Foundation to maintain top-notch research direction and, with additional funds derived from contracts and grants, permit it to carry on the broad program of research for which it has become nationally and internationally noted.

The work of the Foundation is divided several ways but in two major areas, research and education. Research is directed toward fundamental, applied and service areas. Each of these plays an important role in guaranteeing the health of our industry over the years.

Fundamental research is for the most part long term and results in new and improved processes, higher quality products, better packaging and merchandising methods, etc. Applied research is a function of the Foundation from which many of you profit by securing day by day guidance and help in solving little problems.

Still a third area very worthy of mention and overlapping the first two somewhat is that of service. The Foundation helps conduct surveys and reports of the Institute. I am sure we use many of these to great advantage and will therefore not elaborate further.

The second major area, education, encompasses work at the University of Chicago. Here the training of many high caliber young men and women is completed. Graduate work taken at the university, plus research experience at the Foundation, provides excellent training for the people, many of whom find their way into our various companies. Finally, education is spread nationwide through pamphlets and books as well as through the home economics division.

Those of you who attended the scientific and operating meeting yesterday undoubtedly found much of interest in the talk by Dr. C. F. Niven, jr., who revealed the results of the Foundation's work on the use of starter cultures of a specific type of bacteria in the production of summer sausage.

These harmless microorganisms are responsible for the development of the "tangy" flavor of thuringer, cervelat, Lebanon-type bologna, and similar products. Dr. Niven and his associates at the Foundation have isolated and developed a purified culture of these microorganisms and for some time have successfully demonstrated, on a pilot plant scale, that they can produce a completely satisfactory product in 48 hours' processing time.

The degree of "tanginess" or acidity can be controlled at will and the flavor can be produced without the processing failures that not infrequently are encountered in our traditional methods of production.

Some of the other benefits of Foundation research will have become evident to you, if you were not previously acquainted with them, through the Foundation exhibits at this meeting.

You may have noticed, for example, that one entire section of the Foundation display is devoted to product spoilage. Foundation publications in this connection are based on research studies conducted by the Foundation

and provide authoritative guidance for avoidance or elimination of a number of common spoilage problems which trouble processors.

Thousands of copies of a publication relating to green- ing of processed meats have been distributed by the Foundation to members of the industry and direct assistance has been given to many companies experiencing difficulties of this type. A new publication on molds and slimes, just off the press, is of specific value in connection with presliced, prepackaged meat products. These types of spoilage have been apparent for many years but recently have become especially troublesome due to modern methods of packaging and merchandising and to the much extended period elapsing between the time the product leaves the processing plant and the time it is used by the consumer.

Another new publication, relating to spoilage of vinegar pickle products, now is being printed and will be available shortly. Another publication on food poisoning problems provides information with which every processor should become acquainted.

Other Foundation research projects that will be of special interest to you and that are now well under way include studies relating to the use of certain additives in sausage and cured meats; the development of new films for prepackaging meat products; the potential use of enzymes in the tenderization of meats; and a comparative and overall evaluation of quality of imported canned hams vs. domestic canned hams.

A new publication, providing detailed instructions for utilizing Foundation-developed procedures for rapid, in-plant analysis of fat and moisture content of sausage and similar products, now is in press and will be distributed shortly.

This new analytical method, which was discussed at



PART OF THE GROUP of 50-year veterans who received their gold service awards at the convention.

last year's scientific and operating meeting by C. W. Everson, can be utilized in virtually any plant by non-scientific personnel and will provide quality control information while the product still is being processed and corrective measures still can be taken. Reports of studies on hog and beef casings by Dr. Hsi Wang, Foundation histologist, have provided information of value in these connections.

Considerable outstanding information on the nutritional value of our products, including specific information on B vitamins and amino acid composition, has been developed at the Foundation. This information, through scientific and other publications, has been made available to nutritionists, dieticians and physicians and has been utilized as the basis for information included in some of the Institute's advertisements. This nutritional information represents a major Foundation contribution to the promotion of our products as it repeatedly has demonstrated the high quality of meat nutrients.

I believe most analysts say that 1955 will go down in history as one of the most remarkable years this country has ever enjoyed. Our population has continued to increase. Our national production is continuing to expand. Wages have risen. Total national income has grown very substantially.

Business generally probably will have the most prosperous year that we have any record on. However, with all these material blessings, there exist in our economy some very peculiar aspects. For example, I can name several textile mills that have had a most prosperous year while, on the other hand, I can name a few in the same business that are about to throw in the sponge.

A review of the automobile industry offers a similar picture. Some are doing exceptionally well. Others are having quite a struggle. In the sausage industry we have a similar picture. Some manufacturers do very well; others have their problems.

A careful study of the most successful people in our industry will indicate that they usually have one thing in common; they produce high quality products. They make their products to please the consumer because they realize that the consumer is the real boss. The quality attitude must start with top management and receive constant attention from top management.

With such interest from the top, the entire organiza-



CROSS SECTION of the American meat packing industry learning how to do its important job better.

tion becomes quality-minded. Quality starts with the raw materials and includes the best efforts of every employee in processing the products, packaging and delivery to the stores and even includes the retailer, who must display the product to good advantage. Where there is pride in the quality produced, the company's top brand is placed on the package as a guarantee of quality.

Competition is secondary! Successful companies price their product fairly and their goods sell well because they are good value. If everyone in our industry followed their example, there would, no doubt, be more sausage products consumed.

In cities where good quality sausage has been successfully marketed you will find greater quantities of sausage products are consumed. You can prove this to your own satisfaction by visiting stores and observing the quantities of sausage products which are carried in the display cases.

Everyone likes good sausage. Kings, presidents, kids, and all in between relish the famous American hot dogs and cold cuts. Let's keep up their interest by making our products the best we know how.



ACTIVE INTEREST most packers take in their sausage business, with its good possibilities for profit, was reflected in the crowds that examined the product displayed by the Institute's natural casings committee.

AMI SESSION

ACCOUNTING

Control of Packinghouse Operations Through Tests—A. C. Bruner, secretary, East Tennessee Packing Co., Knoxville, Tenn.

Approach to Systemization—L. M. Mannasmith, regional manager, management service department, Arthur Young & Co., Chicago.

The Advantages of a Weekly Profit and Loss Statement—K. R. Woodruff, vice president and secretary, Hygrade Food Products Corp., Detroit.

Increasing Real Income Through Easing the Tax Burden—Raymond A. Hoffman, partner, Price Waterhouse & Co., Chicago.

Control of Operations Through Tests



A. C. BRUNER

• Not too long ago I asked a party who worked for a meat packer how they figured their labor and overhead costs on different kinds of products. He stated that they just used an average cost of handling and then went on to say that they weighed their meat into the sausage department, but they have even quit doing that.

It certainly should be obvious to most of you that it will cost more to make franks than it will bologna and that it will cost more to make sliced bacon than it will to smoke hams.

Today it would seem wise to devote our discussion to two kinds of tests, the cut out tests with special emphasis on the hog cut out test, and processing tests, particularly smoked meat and sausage, and to conversion costs.

The prices used on these tests should be conservative yet realistic. The prices must be your average realization with a small leeway. If you price them too high, you will be fooling yourself and your tests will show profits while your department profit and loss may show a loss. If you price them too low, your purchasing and sales departments will lose confidence in them and will not pay any attention to them.

We must remember that these cut out tests show results based on sales if made at prices prevailing at time of purchases. If there are rapid fluctuations in the market, the profit and loss will show up differently. But certainly where there is a fairly steady market, these tests should tell us pretty well what we are doing. Where you have a weekly P & L, you have a much better check on your cut out tests and, of course, on your pork operations.

When you have achieved accuracy on these tests, you will furnish an excellent guide to your purchasing department on what they can afford to pay, to your management on how many hogs they will kill and to your sales department on what prices they must realize from the pork.

Recently, I was in a group of 60 or more meat packers, and I was astonished to learn that only eight used the hog cut out test. It certainly is not as difficult to work out as they seemed to believe.

You should begin by getting the weights on each kind of a cut for the different averages, such as 180/220, 220/240, 240/270, 270/300, as well as different types of hogs. This should be done by a series of tests. Then take an average percentage on each of these cuts and use these for standard cut out weights. These standard weights can then be used to figure your cut out tests daily. This is very necessary as the live hog market changes almost every day and many of the prices on the various cuts change almost as frequently.

There are two main kinds of hog cut out tests. These are known as the long form and the short form. In the long form you ascertain the credit for all offal as well as the prime cuts. On the short form only the values of carcass cuts are shown and the credits for offal appear only as a total.

In both of these tests you may subtract your condemnation losses, direct labor and overhead from your total realization figures and thus arrive at the net realization. This, compared with the cost of your hogs will give you your profit or loss. Since the offal prices do not change frequently, it is not necessary to compute the long form more than once a week. (See Test 1 on page 168.)

Just one week before I was asked to make this speech, we ran a weekly profit and loss on our fresh pork department and the net result showed up just as the hog cut out tests had indicated.

In recent months, checks with other accountants in the meat packing industry have indicated that too many

not attempt a discussion of the allocation of overhead at this time. Now let us look at tests on two sausage products which have different labor costs. (See Test 3.)

TEST 3: SKINLESS FRANKS AND BOLOGNA

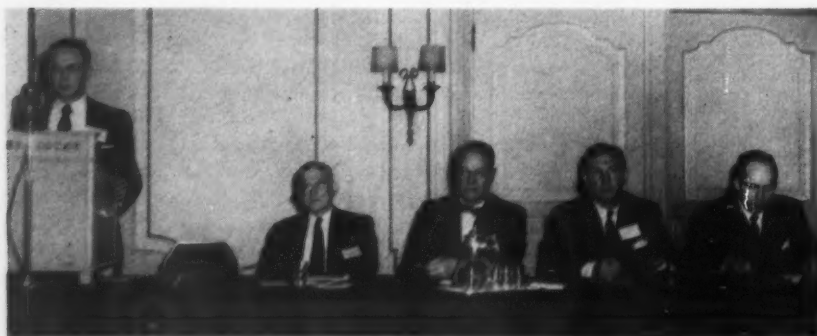
I lb. Franks				Bologna			
	Weight	Price	Amount		Weight	Price	Amount
Pork	250	.13	\$ 32.50		250	.13	\$ 32.50
Beef	200	.30	60.00		250	.30	75.00
Veal	50	.24	12.00				
<hr/>					<hr/>		
Total	500		\$104.50		500		\$107.50
Spice, etc..			3.00				3.00
Casings ..			10.00				6.00
Ice .....			.50				.40
<hr/>					<hr/>		
			\$118.00		\$116.90		
Amount brought forward, \$118.00				Amount brought forward, \$116.90			
Direct Labor			27.00				14.00
Overhead			30.00				18.00
Packaging			10.00				
Yield—550 lbs.....			\$185.00	600 lbs.			\$148.90
Total Cost per cwt..			33.64				24.82
Selling and delivering.			1.90				1.90
<hr/>					<hr/>		
Delivered cost per cwt..			\$ 35.54		\$ 26.72		

The packer has many opportunities to convert one product into another form. To know what to change and whether or not it will be profitable for him to do so, it is necessary to compute the conversion cost. Since the situation is subject to rapid change it is imperative that these computations be made frequently. (See Test 4.)

TEST 4: BONELESS LOINS

Value—16/20			\$33.00	
Boning labor .....			.75	
Overhead .....			.90	
				\$34.65
	Credits			
	Weight	Price	Amount	
Tenders	4.1	.62	\$ 2.54	
Ribs	6.7	.40	2.68	
Trimming	28.5	.13	3.71	
Backbones	15.7	.04½	.72	
To Tank	2.7	.01	.03	
		Total Credits		9.68
				\$24.97
Yield	42.3			
		Net cost per cwt.		\$59.00

In an industry where the profits have recently averaged less than 1 per cent, it is imperative that we know our costs and that we accountants persuade the sales department and management that these costs have been computed correctly. Accurate cost information will lead to better operations and greater profits.



CHAIRMAN T. G. REDMAN of Swift & Company presides at the accounting session while speakers **A. C. Bruner, L. M. Mannasmith, K. R. Woodruff** and **Raymond A. Hoffman** await their turns.

Weekly P & L Statement Valuable Guide



W. R. WOODRUFF

• Our company has prepared weekly profit and loss statements based on weekly physical inventories for more than 25 years. Our people, large plants and small plants, would not be without them.

A short time ago our president, Hugo Slotkin, delivered a talk before the provisions committee of the American Meat Institute, and part of his talk was devoted to weekly profit and loss figures. He stated:

"As you probably have heard, we are on a weekly P & L basis at all plants and branches, including our large slaughtering plants. We close our week on Saturday. The following Tuesday by 5 p.m. I have, by telephone, the actual P & L's for the past week, including sales, inventories, labor, manufacturing expense, shipping and delivery expense, general and administrative charges and head office overheads. In order to clarify what we include in our general and administrative expenses, I might add that it includes salaries of managers, office and credit staffs, communications costs, bad debt reserves and items of that nature.

"By Wednesday morning, these reports are physically on my desk. I agree that it takes a very rugged constitution to get some of those reports at 5 p.m. and makes sleeping rather uncomfortable on some Tuesday nights, but, by having this information so promptly, we can help correct some of the obvious mistakes made the previous week before the current week is too far along.

"After discussing the weekly P & L each Tuesday afternoon with our plant managers, sales managers, provision managers, superintendents and office managers, our thinking on prices can be changed promptly. Instead of being a free seller, we can promptly strengthen our ideas. It flows down into our livestock buyers, who are astute observers of management's financial plight each week.

"Our weekly P & L's check right out into our monthly statement. We have trained our plant people to take a good inventory, and our office people carefully calculate factors of expense which are so close to our monthly statement that it amuses me when packers ask the inevitable question, 'How can you calculate so closely?'

"In addition to our weekly P & L, which comes out Tuesday, by Wednesday evening we have a completed product analysis report, which gives us a clear-cut picture of our production, yields, sales and material profit realization from each department and major items broken down as follows, in cure: hams, bellies, picnics and butts; in sausage: frankfurters, bolognas, liverwurst, etc.; sliced bacon; all canned products; fresh operations; lard, etc.

"The manager has before him an actual hog cut-out realization, which he compares with his previous week's short form tests, and from this he determines the accuracy of his daily tests, plus the actual realization from his

provision and sales department. He scans his realizations, reviews this immediately with his plant cabinet to plug apparent weaknesses or errors in judgment. We show in our earning column the gyrations of the market up or down, plus the selling margin. All products are priced at the market.

"Weekly profit and loss statements are not difficult to install nor expensive to have. They certainly are worth the slight additional cost if they help a packer operate profitably. They can be installed quickly. Our people believe they can be instituted and running properly in the largest of plants within a maximum of two months."

We have striven over the years to make our accounting figures: 1) Accurate; 2) Prompt, and 3) Simple to prepare.

The weekly figures do that. Our weekly figures are summarized on two reports:

1) A weekly profit and loss statement, and 2) A product analysis report.

Our weekly figures are based on: 1) Physical inventories; 2) Exact sales; 3) Exact material costs; 4) Exact direct expenses, and 5) Apportionment of overhead expenses.

Experience has taught us to tie the weekly figures up very closely to actual figures at the end of each four-week period.

I have heard some people state, "Weekly figures are O.K. in a small plant but not practical in a large plant." This is not true! It is just as simple to prepare weekly figures at a large plant as it is in a small plant. Our Indianapolis plant is a comparatively large operation, and our manager there advises me he would never be without weekly figures. He feels that the need for weekly figures is greater in a large plant, where all operations cannot be closely watched by the management, than in a small plant.

The detailed explanation of how we arrive at the figures to insert in these two reports is as follows:

Weekly Profit and Loss Statement: Sales, returns, allowances, purchases, inventories and payrolls are exact figures and tie into the books. Supplies are based on production. As stated earlier, weekly inventories are physical, generally taken by our foremen on Saturdays. Inventories are priced in the office. Sales, returns, allowances and purchases are the same figures when cumulated for four weeks that are posted to the general ledger. Payrolls are arrived at on Tuesday in total and represent actual payroll costs.

Manufacturing expense includes supplies based on production times the unit costs, and the balance of the manufacturing expense is apportioned.

Selling, shipping and delivery and general and administrative expense include exact figures for payroll and substantially exact figures for freight and cartage. Other overhead is apportioned. Overhead apportionment is based on previous month, consideration being given to changes in volume or any known changes from the previous month.

All the detailed figures required to prepare the report—sales, returns, allowances, purchases, inventories, payrolls, supplies, freight, etc., are completed by Tuesday noon so that the weekly P & L report is completed by Tuesday afternoon.

Product Analysis Report (Weekly): This report is a

profit and loss report broken down by departments and items, the profit and loss captions being across the top instead of down the side. This report ties in with material profit as shown on weeklies. The report can be as detailed as desired.

It will be noted the report accounts for weight as well as money, thus serving as an inventory control and yield report. Generally, we do not apply expense to these weekly product analysis reports. These reports are summarized for each four weeks, and expenses applied on the four weekly statements.

What do weekly profit and loss statements cost? Very little. Our Indianapolis plant, which employs upwards of 3,000 people, made a cost study. It reflects a total plant cost of taking inventory of \$489, of which more than half would have been necessary to obtain inventory positions for our sales departments, etc., whether we had weekly profit and loss statements or not.

The added cost of taking weekly inventories at a plant the size of Indianapolis, we calculate to be about \$200 weekly. The office work of weekly profit and loss becomes routine, and we do not feel it adds to our office costs to any extent.

As we see it, the advantages of having weekly profit and loss figures are as follows:

1. Prompt accurate figures by Tuesday of the following week.
 2. Permits immediate steps to be taken to correct conditions that are producing unsatisfactory results.
 3. Eliminates estimated figures which do not tie into the books.
 4. Guides the buying, selling and expenditures on a weekly basis instead of waiting for five or six weeks for period figures.
 5. Condensed, to the point, figures for management.
 6. The weekly product analysis report provides production figures, inventories for comparison with sales, yields, shrinks or gains and material profits by items.
 7. The product analysis report also provides a check against the hog cut out reports and offal credits used on killing tests.
 8. Costs can be checked against weekly figures as to yields, material cost, labor and expenses.
- We have proved our weeklies to be very accurate and a rapid guide to the running of our business.



PURCHASING AGENTS chat over the coffee cups.

Stimulate Earnings by Systemization



L. MANNASMITH

• To kick off this discussion of an "Approach to Systemization," we should first ask ourselves what are the real objectives of a business. There are some who might quickly say, "net profits," but I don't believe they are net profits alone. I will agree that net profits are the end results of a successful interplay of all elements of a business which come about through the attainment of the highest possible productivity from: 1) Labor; 2) Equipment, and 3) Money.

The question now is how do we do it. We contribute to it by: 1) The most effective use of material; 2) The production of better products at lower prices; 3) The creation of the greatest employment stability; 4) Maintaining the highest possible level of wages to all the workers commensurate with their contribution to the business, and 5) Maintaining payment of fair dividends to stockholders.

To do this we must plan for and exercise control over many elements, some of which are: 1) The organization structure; 2) Forecasts and budgets; 3) Cost accounting; 4) Expenses; 5) Methods; 6) Production; 7) Inventories; 8) Records, reports and forms, and 9) Employees, for a) Wage and salary structure, b) Turnover, c) Absentees, d) Accident, etc.

The accomplishment of these things requires, basically, a system—a coordinated plan by which the various papers, records, reports and, more generally, information move through our organization for counting, keeping track of and reporting on its progress. These papers will be our principal concern today, and since Cecil Gillespie of Northwestern University has so well stated their function, I'll quote him here.

Their function, he says, is:

- "1. To determine the results of operations, for a) distribution to accounts, and, b) production of reports.
- "2. To keep track of assets and liabilities.
- "3. To get things done.
- "4. To facilitate planning, follow up and performance."

After associating ourselves with this climate, let us now proceed with the topic for this discussion. I will limit my presentation to the following three areas: What shall we do? How shall we do it? What do we accomplish?

Bruce Smyth of the Federal Reserve Bank says that, "The scope and activities of a central systems department depend primarily upon the managerial philosophies of top management, happenstances of internal policies and the availability of good systems personnel."

I am in complete accord with this statement. The scope must be decided by top management, but if I were free to reach for the moon, I'd set my sights on the following statement as a policy target.

The systems department will be responsible for the periodic review of all company systems, will formulate

recommendations for new and revisions to existing systems and supervise their installation, will conduct systems research, including mechanical and electronic applications, and will control the design and utilization of all forms.

This is a broad policy statement, but from my experience with systems departments, both as a participating member and an outside observer, I think they must be so authorized if they are to be at all effective.

Coupled with this broad policy statement, we must also choose the method of operation. Do we take on the complete job with staff personnel, or do we invite participation of the line supervisors?

My position is that we must not only solicit, we must encourage by every possible means, participation of the line personnel. Offsetting the dangers of this plan, which could lead to too much line influence, is the fact that if the line group members have been in on the act, helped to develop the system, they will see to it that it works—just look at whose plan it is. At this point, let me emphasize, give them credit for it and make a project of it—shout it from the housetops. "Look at what Joe has suggested; let him explain it to you." Can't you see the reaction? The plan better not be about to fail! On the other hand, if you jam it down his throat, over his objections, good or bad, you invite failure and in short order.

Do we hire systems specialists, or do we train the bright young men from the order department, the tabulating room, the shipping department, or elsewhere in the organization?

I've had two kinds of experience with both methods, and with two results: good and bad.

First of all, the market today is such that good experienced personnel are rare indeed, but if you are running in luck, it is sometimes possible to hire them.

Transferring to systems and training of line personnel is a time consuming task, but there are many advantages. Such persons know something of the organization, internal politics and physical layout. They, also, if your selection is sound, know something of the general system and specifically the details of their previous assignment. Try to select employes with a creative imagination and some ability to write procedure. Then take off from here. It is as good a starting point as I can recommend.

From whom do we get our assignments?

First off, let me guess with you that there are several hot projects around the office that no one has been able

or had the time to button up. These are always the first assignments, after which, if they are successfully completed, others will be suggested by various members of the management team and, not infrequently, an alert systems staff will recommend projects to its management.

I have yet to see a going systems department where the backlog of projects was not staggering. I think that all avenues for creation of assignments should be left open and that the screening and priority schedule should be the responsibility of the manager in consultation with his boss.

After we have this much of a bill of particulars, we can proceed to work. They are not intended to be all inclusive, but should serve as a guide in setting up shop.

Let us now examine how we shall go about doing the systems job. I once introduced a work simplification program by designing a formula for it, and I think it applies equally well for the whole systems area. To record this formula, suppose that on the left margin of your note paper, you place the letter "A," on the second line below the letter "A," place the letter "C," and on the third line, the letter "T." Reading downward, these letters spell "ACT" and that's my first rule. Do something! Now, on the line with the letter "A" add the letters "T T A C K." The full word, "ATTACK," in my formula means to take the offensive, to strike at, to be the aggressor, to advance against or march upon. A combination of all these describes my intention and definition.

On the second line, opposite the letter "C," add the letters "R E A T E," and the full word now is "CREATE." This, in my formula means to originate, invent, devise, fabricate and plan.

On the third line, opposite the letter "T" add the letters "E S T." The full word now is "TEST." By this, I propose that we experiment, try, rehearse. We must first prove a theory before we recommend it as the one best way to do a job.

There you have my formula: Attack, create, test.

I am sure that it will serve you well in putting your show on the road and in keeping it in proper balance.

In the absence of one of your specific hot projects, let us assume that our first job is to review all existing formalized procedure manuals and to bring them up-to-date, together with revising the forms records and reports where necessary.

I suggest a 3-R approach, a basic start to: Review, Revise, Rescind.

To get under way, we must first start a collection agency. Gather together in one place all the existing procedures, memoranda, letters from management and other forms of instruction, together with sample copies of all forms, records and reports. At this stage, don't underestimate the amount of work and storage space necessary, brace yourself and condition your management for a mild case of shock. There are always so many different pieces of paper that one viewing them for the first time in one location has difficulty adjusting to the great mass of them.

Following the collection phase, the review program gets under way. I won't attempt to describe all the steps to be performed but suggest that a schedule be prepared listing separately each procedure and the records, reports and forms applicable thereto, and that some kind of



MOUSE'S EYE-VIEW of a convention session with a "sho-nuf" Texan on the right.

priority sequence for review be established. Then start the attack, "Roll up your sleeves and dig in."

I will not list a slate of rules on what to do during the review process but will only caution you to examine critically both the procedure and forms to determine: 1) Their purpose; 2) Whether they are really necessary; 3) If necessary, whether they get the job done; 4) Whether the forms can be condensed, combined, eliminated; 5) If the procedure can be misunderstood.

After these basic questions, and others which will arise, are satisfied we can move on to the REVISE step in our plan, and the CREATE phase of our formula. We must set up a pattern, a layout for the procedure, the manner in which it is to be presented, and the style. Procedure style is defined by Professor Haga of the University of Minnesota as "the right words in the right places," and as he further states, since we produce procedures to get action, our style should be one that most economically and most surely triggers action.

I subscribe to his style, which is to begin instruction sentences with affirmative verbs to convey affirmative orders, such as:

1) List all disbursements—; 2) Attach receipts in support of—; 3) Balance totals—; 4) Approve the form, etc.—.

This style stimulates the doing of a job and is rarely misunderstood. Not too long ago, my attention was directed to a procedure gem contained in the Internal Revenue Code, since revised, fortunately. It stated:

"General rule—if contributions are paid by an employer to or under a stock bonus, pension, profit-sharing, or annuity plan or if compensation is paid or accrued on account of any employee under a plan deferring the receipt of such compensation, such contributions or compensation shall not be deductible under sub-section (a) but shall be deductible, if deductible under sub-section (a) without regard to this sub-section, under this sub-section but only to the following extent."

I don't believe there is any way you could further confuse this instruction if you set out to do it. If faced with the need to explain it, the author would probably take the same position as the character Klopstock, who said, "God and I both knew once, but now only God knows."

Form revision, or more properly form design, is an area for real pay dirt. There are many sources of instruction on this subject, and most of the form printing companies have developed special departments to assist in this phase. I will only suggest here that a great deal of time should be spent in determining the facts, and this includes challenging all statements about a form until the purpose and need are firmly established, and only then should the criteria of good form design be applied to the problem.

Here is one thought with respect to procedure writing and the related form design. I strongly recommend the development of a flow chart to be worked out from the procedure text, to make certain that all pieces of the procedure and the routing of each copy of the form are clearly stated. It is not at all unusual to find that the fourth copy of a form, described on page three of the procedure, is left there with no place to go. Charting will disclose this type of deficiency.

To discuss the TEST portion of our formula, I have found that a dry run of the proposed system to "debug"

it is a most worthwhile operation. This, of course, suggests running the new procedure as a parallel to the old operation for a short time. This is a particularly important step when mechanical or punched card applications are installed to replace manual activities. Such tests must produce acceptable results to the line organization and management before the old system is discarded.

Our third "R" was to "Rescind." This is most profitable of all and means simply to eliminate the procedure which, during the review operation, was found to be unnecessary. Once started, the use of a form, record or report is frequently much harder to stop than it should be. The individual or group with whom it originated is always reluctant to part with it and can produce overwhelming evidence in its favor. In this effort our systems man must, to paraphrase Shakespeare, "Be a kind of a burr—he must stick."

Let us for a moment consider a slightly different kind of a system job and how we do it. Supposing we are called upon to study a phase of our operation and advise our management on the economic utilization and other advantages of punched card equipment. How do we proceed?

Such a program demands of us a knowledge of punched card equipment and techniques, which we will assume. As a prerequisite, I would develop a plan and set up a target date for its completion based upon a general knowledge of the function. Then as a first step I would:

1. Survey the entire function, in complete detail, cutting across department lines where necessary to start at the creation of the source document and ending with the final result developed from it.

I cannot overemphasize the need for doing a complete and thorough job of surveying and noting in detail what actually happens. I am sure you know that there are at least three ways of carrying out a procedure: the way it is prescribed by the manual, the way the boss thinks it is done, and the way the clerk or operator does it.

My next steps in the mechanization program would be:

2. Develop actual volume counts of the high and low periods.

3. Determine the time table for document flow and reporting requirements.

4. Obtain samples of all documents, records, reports and forms.

5. Determine the maximum number of characters or digits in each element of the source media, the current records and the reports produced.

6. Determine as accurately as possible the present cost of performing the function.

These steps do not exhaust all those to be performed, but for today let us assume that they do. We can then proceed to the development of a punched card program for the function, basic steps of which would be to:

1. Prepare a flow chart of the entire operation on punched card equipment.

2. Design card forms for the source media and for producing the desired records and reports.

3. Lay out the records and reports to be produced.

4. Consult with punched card equipment representatives on the feasibility of the program and obtain estimates of equipment and card costs, together with installation charges.

5. Develop a time table for production of records and reports.

6. Prepare a cost estimate and, together with an outline of the proposed procedure, advantages, disadvantages and comparison with the prior costs, develop a recommendation for the management.

The system job at this stage is only partially complete, of course, since, if accepted, it will be necessary to develop conversion procedure, dry runs, final detailed procedures, training programs and full blast educational programs for the supervisory and management group in punched card accounting techniques and probable results.

During my several experiences in developing and installing tabulating systems, I have learned to be extremely conservative about predicting the success of an installation. I should like to pass on to you three important "don'ts." They are:

1. I would not permit myself or my management to become overenthusiastic about the potential savings, "speed up" in operation, the accuracy of the final result or the date when the projected savings will be realized.

2. I would not permit the conversion of more than one function at a time, and I would space the conversions far enough apart to have completely digested one before biting off another.

3. I would not permit a basic change in the system simultaneous with conversion to tabulating methods. I would insist on working out the "bugs" of the system change on the old basis before attempting to convert to tabulating.

To sum up the considerations for this section of "How shall we do it?", I should like to present a program developed by Wm. A. Gill of Washington, D. C. He put it this way:

S tart with a plan.

U se facts wisely.

C ultivate the right people.

C onsider the human element.

E ngage in promotional efforts early.

S ave supervisors from added frustration.

S peak and write sensibly.

There are green spendable dollars, lots of them, waiting to be exposed and salvaged by the systems group in practically every organization in the world. Measurable evidence of this fact is being produced every day by countless numbers of case histories. A few projects with which I am familiar that might be of interest to you are:

1. A national merchandising organization—A study made of the methods for buying, warehousing, shipping,



ONE OF THE QUIETER moments in the lobby off the meeting hall.

billing, sales recording and replenishment of merchandise resulted in the design of a system for tabulating equipment which saved the company several thousands of dollars annually by reduction of clerical expense and contributed to a substantial increase in profits through better control data and more rapid analytical reports of sales and inventories.

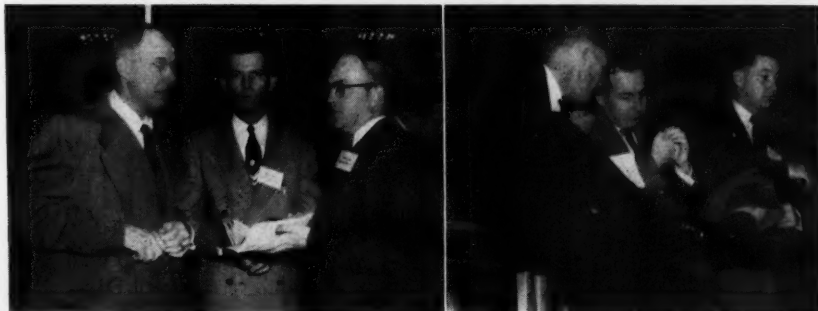
2. A chemical production and distribution company on a single project for form control, was able to reduce its printing bill from approximately \$50,000 to \$32,000 per year, plus the non-measurable economies of clerical handling expense.

3. In a metal stamping plant a systems review of the plant timekeeping methods resulted in a revision to the system which reduced the timekeeping costs by 50 per cent.

4. In a medium sized petroleum company a study of the customer credit card and billing procedure resulted in the installation of a prepunched tabulating credit card system which saved the company over 20 per cent of its previous cost in this operation and further reduced the outstanding accounts receivable.

5. In a book publishing and sales company one project for commission accounting resulted in the decentralization of the detailed accounting records reducing costs by approximately 25 per cent.

These are a very few examples of accomplishment. The recent development of electronic digital computers for processing business data, another tool in the kit of a systems man, offers real opportunity for reducing clerical costs and improving profit performance. They are not exclusively for the giants of industry. There are many studies currently under way for medium and smaller firms in all fields of business activity.



INFORMAL SHOTS of conventioners chatting in the lobby and passing a few remarks during one of the sessions.

Explains Ways to Ease Tax Burden



R. A. HOFFMAN

• For present purposes the term "real income" means spendable income. It is used in the same sense as the phrase "take-home pay" or "earnings after tax." From a long-range viewpoint it may be said that the best way to increase real income is to advocate a reduction in tax rates and the elimination of as many taxes as possible. This, however, does not go to the heart of the matter.

Since each of the governmental agencies imposes only such taxes as are required to raise the revenue necessary to cover approved expenditures, it follows that the elimination of waste and the discontinuance of nonessential services are the key to a tax reduction and an increase in real income. Regrettably, this basic principle is less interesting and more difficult to reflect in immediate action than direct, temporary expedients.

The present discussion will of necessity be limited to a selection of direct measures which may be considered to ease the burden of federal taxes on income. To appreciate the scope of the general subject, however, it is significant to observe a recent announcement that the average wage earner pays almost 35 per cent of his income to support the federal, state and local governments.

The Illinois percentage is but slightly higher than the national average. It is also significant to note that while the federal government cut its spending 4 per cent in the 1954 fiscal year there was an 11 per cent rise in state and local government spending. A reduction in the federal budget, therefore, will not necessarily increase real income.

The common expression that "A penny saved is a penny earned," is particularly appropriate with respect to federal taxes on business income. Even some of the procedures which can be followed to defer tax in many instances will actually increase earnings. Either the deferment will be for such an indefinitely extended period that it takes on the characteristic of being permanent or the future tax computation will take into account entirely different factors which will provide relief. Any procedure, therefore, which tends to reduce current taxes, such as paying excessive prices currently to acquire inventory or plant or delaying the acquisition of properties which will improve the business operating results, should receive careful consideration by business executives.

For many years accounting theorists and economists have contended that business income cannot be properly measured by merely spreading the cost of properties ratably over the useful life. Although a straightline method of depreciation has been used almost without exception it has been recognized from a theoretical standpoint that a larger portion of the cost of the properties should have been charged against the earnings of the early years. The Internal Revenue Code of 1954 gives recognition to this premise and every business has an opportunity to elect, with respect to acquisitions after

December 31, 1953, the declining-balance method of computing depreciation, the sum-of-the-years' digits method, or any other consistent method which clearly reflects income.

The choice between the accelerated depreciation methods must be made under the facts in each individual case. To be sound, however, the choice should not be premised upon a hope of securing the benefits of having a recoupment of depreciation taxed at capital-gains rates. Fundamentally, the lower rates applicable to capital gains are justified because of such gains not being comparable to current earnings. Basically, such gains are attributable to a change in the value of the dollar or to a change in the economic value of a particular piece of property as a result of circumstances which are beyond the taxpayer's control.

If one of the accelerated depreciation methods is applied to a single unit of business property which will have only a relatively short useful life the period of tax deferment will, of course, similarly be short. In the case of a business, however, which is continuously acquiring new properties, the tax deferment will come close to being permanent in character.

The use of the accelerated depreciation methods is worthy of consideration not only because of easing the tax burden but also because there should be a more accurate determination of income. It is this latter factor that makes it advisable for business to consider carefully the desirability of using the accelerated methods for financial statement purposes as well as for tax purposes. If this is not done it may be said that the permission to use accelerated method for tax purposes is merely a way of stimulating industrial expansion and is not needed to reflect income clearly.

On November 9, 1955, there were filed for publication in the *Federal Register* substitute proposed regulations under the depreciation provisions of the Internal Revenue Code of 1954. In publicizing regulations in such tentative form, the procedure is that prior to the final adoption of the regulations consideration is to be given to any data, views, or arguments submitted to the Commissioner of Internal Revenue within the thirty-day period following the date of publication. These proposed regulations which are being substituted for those published some months ago merit careful study by businessmen.

One item of particular interest is the modification of the general rule that the election of depreciation method is to be made in the federal income tax return for the year in which the property was acquired. If a return has been filed for any taxable year ending after December 31, 1953, an election to compute the depreciation allowance under any of the methods specified in the Code or a change in election may be made in an amended return or claim for refund filed on or before the 90th day following the promulgation of final regulations under this section.

The provision in the current proposed regulations to the effect that in no event shall an asset be depreciated below a reasonable salvage value is quite significant. The term "salvage value" is defined as the amount realizable upon sale or other disposition of an asset when it is no longer useful in the taxpayer's trade or business and is retired from service by the taxpayer. It

is possible that the language in the proposed regulations should be clarified to avoid current fair market value of property being introduced as a limiting factor rather than salvage value.

Another provision in the proposed regulations which could require a change in past business practices pertains to the timing of the initial depreciation provision. The general rule is that the period for depreciation of an asset shall begin on the date when the asset is placed in service, and shall end on the date when the asset is retired from service. An average of the beginning and ending asset account is permitted even though it is recognized that this practice is based upon an assumption that all additions and retirements occur uniformly throughout the year. The disturbing factor is that the proposed regulations state that no other assumptions may be made with respect to the timing of additions and retirements during the taxable year.

During recent years there has been a growing tendency toward the leasing of property and even relatively short-lived equipment instead of buying it. In most cases it is believed that this tendency has been prompted by a desire to utilize more property than the normal working capital and credit resources of the company would permit.

In addition, however, certain tax advantages have been stressed, i.e., a desire to set rentals which were higher during the early years of use and to eliminate the possibility of discussions with revenue agents as to the useful life of property. The right to use one of the accelerated depreciation methods to a certain extent reduces the tax advantage from leases. In individual cases, however, the possibility of leasing property merits consideration.

Although the Internal Revenue Code has always permitted a deduction for rentals paid, there have been instances in which the lease was deemed to be a contract of purchase. This is particularly true where the lessee was given an option to purchase the property on the basis of a diminishing price scale.

The published decisions to date have been somewhat conflicting and recently the commissioner of internal revenue has advanced his own set of rules to be applied in determining whether contracts for the use of equipment are leases or contracts of purchase. His position is that unless there is strong evidence of a true rental being involved, the transaction generally will be treated as a purchase of property if one or more of the following conditions are present:

1. Portions of the periodic payments apply specifically to an equity to be acquired by the "lessee."
2. The "lessee" will acquire title upon payment of a stated amount of "rent," which must be paid in any event.
3. The total amount which the "lessee" must pay for a relatively short period of use is inordinately large in proportion to the total sum required to be paid to secure transfer of title.
4. The periodic payments materially exceed current fair rental value.
5. The property may be purchased under an option at a price which is nominal in relation to the value of the property at the time the option may be exercised, or which is a relatively small amount when compared with the total payments required.



WHO DO YOU KNOW in this AML convention photograph?

6. A part of the "rent" is specifically designated interest or is readily recognizable as tantamount to interest.

The commissioner's ruling also holds that even where there is no purchase option the contract will not be recognized as a lease if: a) The "lessee," either by the original lease term or by renewal options, can continue to use the property over its entire useful life, and, b) The total rentals over a relatively short period of time approximate the price at which the equipment could have been acquired by purchase plus interest and carrying charges.

In view of the uncertainty of the federal income tax status of payments made under any form of lease to which the foregoing rules could apply, careful consideration must be given to the consequences of the contract being held to be one of purchase. An election to use one of the accelerated depreciation methods must be made in the tax return covering the year in which the property is acquired.

Care should be exercised, therefore, in wording an election of accelerated depreciation so as to cover the cost of "all property acquired during the year," i.e., not only the cost of properties added to the capital accounts on the books but also the cost of any additional properties which may have been charged to expense on the books or which may have initially been considered as subject only to rental agreements.

The Internal Revenue Code of 1954 permits the filing of a consolidated return on behalf of corporations which are controlled to the extent of 80 per cent or more by a common parent. The imposition of the 2 per cent higher tax on consolidated income makes it frequently necessary, however, to consider alternative ways of having losses of certain subsidiaries taken into account in determining the taxable income of a business unit.

The filing of a consolidated return as a means of reducing current tax through utilizing operating losses of a subsidiary is inadvisable because of the possibility of the affiliated group being forced also to file a consolidated return and pay the additional 2 per cent in tax for subsequent years. This was particularly true with respect to the calendar year 1954 since it seems unlikely that members of an affiliated group filing a consolidated return for that year will be permitted to file separate company returns for 1955.

Steps which can be considered in this type of situation

include at least the two extremes of placing additional income-producing operations in the loss company or liquidating the loss corporation completely. In a case where it is not feasible to expand the operations of the loss corporation the alternative procedure may produce substantially the same tax result.

The Internal Revenue Code of 1954 specifically provides for the carryover of net operating losses from one corporation to another, e.g., by reason of a loss subsidiary being liquidated into the parent corporation. There are a number of additional statutory provisions designed to prevent one corporation acquiring a loss company primarily in order to get the benefit of loss carryovers, but where both corporations have continuously been part of a single group, it is now easier to avoid the situation in which an operating loss fails to enter into the determination of tax.

In enacting the Internal Revenue Code of 1954, Congress included provisions which were designed to bring the practices of determining income for tax purposes more nearly in agreement with general business practice. When it was found that the effect on revenue was going to be considerably more than the Treasury Department's original estimate, these accounting provisions were repealed retroactively. It is to be hoped, however, that the provisions will be reinstated in the not too distant future.

Business is presently being faced with three specific problems as a result of the enactment and repeal of these sections: 1) A determination of steps to be taken to preserve the right to provide for vacation pay; 2) A determination of what steps should be taken to establish the right to provide for vacation pay and other continuing business obligations, and 3) A decision of the treatment to be accorded provisions for estimated expenses made in 1954 financial statements.

The Treasury Department has indicated that previously effective rules will continue to be applicable to the allowance of provisions for vacations through the calendar year 1955. Unless the Treasury Department's position is changed, however, business may find itself in the position of not being allowed any deduction for vacation expense in the calendar year 1956 unless the commitment for vacations is made more specific. Union agreements and announced vacation policies may also require careful study in those cases where the taxpayer has not previously claimed a deduction for vacations but desires to commence doing so in the current year.

Where a provision was made in the 1954 financial statements for product warranties and other items of estimated expense which would have been allowable as deductions for federal income tax purposes had the accounting sections not been repealed, some companies are considering the reversal of these reserves in 1955.

A decision to revert to the past accounting practices should not be made, however, without weighing the implications which would work to the taxpayer's disadvantage in the event a similar accounting provision is enacted at a future date. It hardly can be said that the federal income tax law should be made to conform to good accounting practice if such "good accounting practice" is currently discontinued and not resumed until such time as the income tax law is again modified.

A more sound procedure would be to provide for the

estimated expenses on a net-of-tax basis. This would have no effect upon the reported income for 1955 and would merely mean a reclassification in the balance sheet of a portion of the reserve for estimated expense to the reserve for federal income tax.

The artificiality of "a taxable year" (normally the calendar year) and the graduated rates of tax applied to the income of individuals give rise to a number of tax planning practices which would not be significant if the tax was applied only to the aggregate earnings of a particular taxpayer on a lifetime basis or if there was a flat rate of tax. The principle of graduated tax rates and the limited extent to which income for several years may be averaged requires, however, that careful consideration be given to steps which will ease the burden of the federal income tax. This problem must be considered by management of business because anything that will increase the real income of the employees ultimately will benefit business earnings. Procedures that can be followed to reduce individual taxes, therefore, merit consideration by the employer.

There are a number of instances in which options to purchase stock of an employer have been given for the purpose of facilitating the acquisition of a proprietary interest in the company. Where the option price is substantially less than the market value, the Treasury Department generally takes the position that taxable income is realized at the time the option is exercised.

The Code does contain specific rules which are applicable in the case of "restricted stock options." This type of option merits careful consideration, and although the benefits are premised upon the application of the capital-gains tax rates, such application can be justified because it is an inherent element of the total transaction that there be an increase in the market value of the corporate stock involved.

The provision for restricted stock options has been included in the Internal Revenue Code since 1950 and its popularity has increased in recent years. This procedure must be used with care, however, in the case of stock which is closely held or for which it is difficult to establish fair market value.

No income tax liability arises at the time of the exercise of a restricted stock option. When the stock so acquired is disposed of, however, ordinary income or capital gain will be held to have been realized as follows:

When the option price is at least 95 per cent of the fair market value of the stock at the time the option is given, then all the profit realized on the sale of the stock will be long-term capital gain provided the stock is not sold until after the expiration of two years from the date the option is granted and six months from the date the option is exercised.

Where the option price is between 85 and 95 per cent of the fair market value of the stock, ordinary income is deemed to have been realized to the extent of that portion of the gain realized upon the sale equal to the excess of the fair market value of the stock at the time the option was granted over the option price.

The option must, by its terms, be nontransferable other than by death and must be exercised by the employee not later than three months after terminating the employment.

If the employee or his family owns more than 10 per

cent control of the company at the time the option is granted, the option price must be at least 110 per cent of the market value at the time the option is granted, and cannot be for a period longer than five years.

The graduated rates of tax imposed upon the income of individuals have in many instances stimulated an interest in contracts of employment which provide for payments of compensation over a longer period of time. In many instances the payment period will extend beyond normal retirement age and may be conditioned upon good conduct and a willingness to render such consultation services as the company may require.

Compensation contracts are significant not only to executives who are nearing retirement age and wish to provide some measure of security for their post-retirement years, but the principle also is being recognized in programs to compensate employees generally. The guaranteed annual wage theory is in part at least founded on this principle. Because of the substantial amounts involved, however, it is necessary that a business be entitled to receive a current deduction in the year of payment into a fund to provide a guaranteed annual wage.

This question is now under consideration by the Treasury Department, and it appears possible that such deductions will be allowed even though the employees will not be held to have realized any taxable income until distributions are made from the fund. Income earned on the amounts on deposit possibly will be subjected to tax. In the case of compensation contracts with corporate executives on an individual basis, the income tax law from a practical standpoint precludes the corporation paying the money into a trust and no deduction is allowed until the disbursements actually are made during the post-retirement period.

The Internal Revenue Code of 1954 provides for excluding from the taxable income of employees amounts representing the continuation of wages at a rate not in excess of \$100 a week during a period of absence from work caused by an accident or by sickness with the exception of the first seven days. This gives the employer an opportunity to cooperate with the employee in easing the individual's tax.

An example of the manner in which the provision will be applied as contained in the proposed regulations is as follows:

Employee A, who receives regular wages of \$70 per week, normally works five days (Monday through Friday) during each week. A is absent from work from Friday through Monday (two working days) on account of an injury, but receives his regular wages with respect to such period of absence under his employer's accident and health plan. Unless the plan of A's employer, or the contract, statute, or regulation under which A is employed, provides otherwise, it will be presumed that A is not paid with respect to non-working days (Saturday and Sunday). Therefore, the amount received by A with respect to his period of absence from work due to injury is \$28, which is two days' regular wages. If the plan, or the employment contract statute, or regulation had provided that wages were paid on a seven-day per week basis, A's daily wage would have been \$10, and the amount attributable to the period of absence would have been \$40 (\$10 per day for four days).

In the case of a period of absence from work on

account of sickness, the general rule is that the exclusion from the employee's taxable income does not apply to amounts attributable to the first seven days of the period of absence unless the employee is hospitalized on account of the sickness for at least one day during his absence. For this purpose the proposed regulation refers to seven calendar days rather than seven working days. Following is an example of the application of this rule:

Employee C normally works five days (Monday through Friday) during each week. On Saturday, October 2 (a non-working day), C incurs an illness as a result of which he does not return to work until Wednesday, October 13. The period of absence from work due to sickness commences on Monday, October 4, and terminates when C returns to work on Wednesday, October 13. If C is not hospitalized during this illness, section 105 (d) does not apply to amounts which C receives under his employer's wage continuation plan attributable to the seven-day period commencing Monday, October 4, and ending Sunday, October 10, inclusive.

Of particular interest to business at the present time is the proposed regulation filed in *The Federal Register* on October 11, 1955. This proposed regulation places a considerable burden of record keeping upon the employer, and it is possible that many objections have been filed with the commissioner of internal revenue. If the regulations become final in the proposed form, the payroll departments will be required to review their present procedures in most cases.

To the extent that employees incur expenses required under the terms of the employment, they constitute a direct deduction from income in the true sense of the word. It is incumbent upon the employer, therefore, to assist the employee in maintaining adequate records. Where the employee accounts for his expenditures and is reimbursed specifically, the burden of proof is shared by the employer, and a more accurate determination of taxable income will normally result.

A provision which is new in the 1954 Code permits employees, who fall within a general definition of outside salesmen, to deduct expenses incurred in such a selling effort in computing adjusted gross income in addition to using the standard deduction. To this extent such employees are now treated in the same manner as independent contractors with reference to entertainment expenses, telephone, clerical help, etc.

During the past year a decision was entered to the effect that an employee was not entitled to a deduction on his individual return to the extent that the amount he expended would have been reimbursed by the employer if an appropriate expense account had been submitted. This principle also places a responsibility on the employer to assist the employee in not being required to overpay his tax merely because of inadequate records and accounting procedures.

The Treasury Department representatives will not try to tell anybody how to run his business, what he should spend, what he should spend it for or interfere with established and accepted commercial practices. The Internal Revenue Service intends, however, to see that business people do not abuse the privilege of tax deductions. Employees with expense account problems merit sympathetic understanding and assistance. In many cases they have received undeserved criticism.

AMI Approach to Problems Works

• Most of us were either quite young or were still just a chromosome when the predecessor organization to the American Meat Institute was organized. Fifty years ago this fall, a group of the "beef barons" or members of the "beef trust," as the packers frequently were referred to in those days, feeling the need for a national trade association, met here in Chicago and laid the foundation for the Institute of American Meat Packers.

If any industry ever needed a trade association, the meat packing industry certainly did then. To remind you that we were in the dog house would be putting it mildly. We weren't even in a first-class dog house. In the eyes of the producer, the consumer and the government, we were a gang of robbers and ruffians. That was bad enough, but when Upton Sinclair wrote and published his book, "The Jungle," we also became in the eyes of the public very unsanitary and dirty robbers and ruffians and enemies of the public health to boot. The meat packing industry was really the "low man on the totem pole."

In 50 years we have come a long way along the road toward establishing the meat industry as an honorable one that takes its place alongside other major industries in our national economy.

Likewise meat, as a food, has been the object of vicious attacks in years passed. As recently as 1929, a vast number of people and doctors believed that meat was practically rank poison. Today meat is recognized as the heart of the menu.

Who has been responsible for these changes? The AMI cannot take full credit, but I think it is safe to say that the Institute has been a major factor in bringing this about. While some of us may think that we are fairly self-sufficient with our own public relations and research staffs, we at times become pretty much engrossed with our own individual problems. The Institute, however, with its staff of 60 trained men and women functioning in ten coordinated departments keeps our goal and our best interests in mind 52 weeks a year.

Many people on the staff are recognized nationally in their field. For example, Wesley Hardenbergh is a member of the livestock advisory committee of the USDA,



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which directs the research under the Hope-Flanagan bill. He is also former chairman of and a member of the administrative committee of the N.A.M. manufacturing trade group and also a member of the trade association committee of the U. S. Chamber of Commerce.

Homer Davison is a member of the President's national agriculture committee, which counsels directly with the President and the Secretary of Agriculture on many agricultural problems.

Various other members of the staff are very close to livestock groups and retail associations. With these contacts they are in a position to keep closely posted on any developments that affect our industry.

This organization functions in two broad fields, offense and defense. On the offense, it is working continuously, attacking our common problems, both of a current nature and of long-range classification. On the defense, it serves as a watch dog, ever ready to jump to the defense of the industry against unjust or unwarranted attacks from whatever source.

This staff of 60 people works with and through 37 committees composed of packers and other authorities that serve every function of the meat industry.

Let me briefly refer to some major accomplishments of the industry over the last 50 years. When I say the "industry" I am not unmindful of the very important part the Institute has played. The industry could not have accomplished these things without the Institute to carry the ball and, conversely, the Institute could not have done it without the guidance and support of its members.

In the early days, the Institute's science division consisted of Dr. W. Lee Lewis and one secretary. Dr. Lewis became famous during World War I as the inventor of Lewisite gas. Plant veterans still chuckle in recounting his awesome descent on packers whose sanitary practices were, shall we say, questionable. Dr. Lewis would throw open the doors to the killing floor, clamp his hands on his hips and roar, "Bugs . . . bugs . . . bugs. Where's your hypochloride?" That roar became a by-word in every packing plant of the land. It paid off, individually and collectively.

Dr. Lewis' vision, backed by the science committee and directors of the AMI, was one of the primary forces in the science revolution that swept our industry between World Wars I and II. One direct result was the development of the American Meat Institute Foundation and its establishment in the splendid plant on the University of Chicago campus. There, the crucial experiments on lard were conducted and the antioxidants developed that helped put lard back in the running as a kitchen shortening.

Out of AMIF, too, came the techniques for fat-spraying livestock feed that this year will remove an estimated 280,000,000 lbs. from our animal fats surplus. Today the AMIF teams of researchers not only service us in everyday problems but are pioneering far down the fascinating road of antibiotics and atomic radiation we have glimpsed at this meeting.

What has been done about producer relations? We can all remember when "the packer" and "the Yankee" had one thing in common. From the Ohio on south, it wasn't "the Yankee" but "the damn Yankee." And, in any farm or ranch area in the U.S.A. 25 years ago, it

wasn't "the packer" but "the damn packer." We were the ogre of the farmhouse.

We had magic formulas that enabled us to pay ruinously low prices for livestock and sell the meat at fantastically high prices. Today, thanks in very large part to the patience, understanding and skills of that corps of experts at AMI, the packer and the livestock producer work as a team. The job wasn't done with mirrors or magic. It was done with honesty, with patient examination of individual problems and the slow, sincere approach to solution of mutual problems. Some of the AMI's most helpful cooperators today are leaders in farm and producer organizations.

Just as patiently, and successfully, the AMI tackled our problem of consumer understanding. Americans were always hearty meat eaters. Indeed, some of our outstanding pioneers and national heroes subsisted on all meat diets. Davy Crockett and Daniel Boone did during their wilderness journeys. So did the mountain men, the hunters and trappers of the Far West.

But meat-hunger was literally a blind hunger. People didn't know why they liked meat, or what it did for them. And, by 1929, the vegetarians had us backed to the wall. Meat, they said, was rank poison. A good many family doctors believed them. They prescribed no-meat diets for patients. Meat disappeared from the menus of many hospitals and, for that matter, many restaurants.

In 1929 our Institute underwrote a year-long experiment at Bellevue Hospital in New York City. There the Arctic explorer, Vilhjalmur Stefansson, and an assistant went on an all-meat diet, under the supervision of a team of nationally known physicians. That experiment scotched forever the fallacy of "meat is a poison." It revolutionized dietary thinking. Subsequent research, much of it launched or inspired by the AMI, has proven meat's essential roles in human health.

Last month Stefansson addressed a food editors' dinner here in Chicago. He is 76 now and a bit chubby so he's reducing on an all-meat diet in which he obtains 80 per cent of his carbohydrates from animal fats.

For more than a decade, AMI has worked closely with the Council on Health and Nutrition of the American Medical Association. This group reviews every statement made by the Institute regarding meat's many roles in human health. None of our meat-and-health advertisements in medical journals is printed until the council has accepted the contents as scientific fact. Consequently, the medical profession in 1955 is a staunch supporter of, and good-will ambassador for, meat.

The American's meat appetite is no longer a blind-hunger. Our 165,000,000 customers are eating 160 lbs. of meat per capita this year because, over and beyond the tastebud pleasures, they rate meat Number 1 in the list of all daily foods as a source of nourishment and proteins. You will recall that Elmo Roper, reporting on the AMI's national consumer survey before this convention two years ago, said, "Meat has nosed out milk as the single most nutritive food." The influence of all this research on meat sales is obvious. Now, thanks to AMI, the consumer not only knows that he wants a lot of meat but why he wants it.

But, important as it was, the "meat-is-poison" bugaboo was only one of our consumer education problems. Most consumers have lost touch with the farm. What

happened between the cowboy quartet singing "Home on the Range" and the butcher in a straw hat trimming a tenderloin? Wasn't a steer all steak and a pig all pork chops? What was all this nonsense about distribution costs? All a packer had to do was kill the animal, skin it and put it in a refrigerator car, wasn't it?

Again, as an industry, we pioneered through AMI. The institutional advertising campaigns carried out by AMI have, undoubtedly, been one of the best educational campaigns ever undertaken by an industry. They did not explain any individual packer's problems. They explained all our problems, succinctly and in the language of Mr. and Mrs. Citizen. Similarly, they did not sell any individual packer's brand of beef, pork or lamb. They sold everybody's beef, everybody's pork, everybody's lamb, and they told where it came from and how much there was of it and what prices to expect, and—all importantly—why.

Again this year, AMI is launching a noteworthy campaign of advertising education—and I stress that word "education"—in the national press. The Institute is continuing to tell the basic nutritional story of meat through its advertising, publicity and educational program. For example, just last week *Life* magazine carried one of our advertisements on the food value and digestibility of pork sausage and bacon.

Right after the first of the year *Life*, *Saturday Evening Post* and a number of other magazines read principally by women will tell the same story about pork in general. We plan to do the same thing for beef in the spring and for cold cuts and frankfurters in the summer.

But there has been something new added to our program for this year. The industry, through the Institute, is launching a dramatic, forceful merchandising and selling program through retail stores. Colorful store material, bigger and brighter than anything the Institute has ever done in the past, will be displayed all through the months of January and February in thousands of retail stores throughout the country. At that time, of course, these posters will sell pork.

This program is providing the umbrella under which all segments of the livestock and meat industry are carrying forward one of the biggest merchandising and promotional programs ever conducted on one product. Producers, meat packers and retailers are going to have an opportunity for the next several months to sell pork, we believe, as it has never been sold before.

There are plans for a similar merchandising program on beef in the spring and for cold cuts and frankfurters in the summer. We believe that it offers individual companies an opportunity to merchandise and sell their own products in a manner that has never been possible before. The important thing we must do, however, is to make sure that our own sales and merchandising departments take advantage of the opportunities that the Institute's program offers to them.

But public relations in this day and age doesn't stop with advertising. The traditional technique, in reporting a public relations program, is to festoon a room with newspaper clippings and magazine tearsheets, all proudly bearing the organization's name somewhere in the text. Again, in the tradition of service-to-all, AMI's press and magazine services haven't operated that way. These fellows are doing an educational job about meat and not

about AMI. Indeed, if they talked a bit more about themselves, I might not feel this urge to report on them.

Year after year you have read newspaper editorials about meat; women the country over have read and cut out magazine and women's page articles about meat recipes; your kids have traipsed home from school chanting meat facts learned from textbooks and encyclopedias.

Some of this material gives a nod to AMI and a whole lot of it doesn't. Mention or no, either the copy, the idea for it or the research behind it originated in AMI's public relations department.

The research and public relations divisions assure me they average 15,000 to 20,000 requests each year for information about meat and the meat industries from schools, service clubs and individuals. Each of these constitutes a research problem.

To date, the Institute's film, "This Is Life," has been shown to more than 3,700,000 school children in every state and territory. This is a certified audience and a conservative figure. In addition, the film has been used on more than 400 television programs so an estimate of the film's total audience could run to 30,000,000 or 40,000,000 people.

Even that isn't half the story. There's another mighty and important facet of public relations. Some people call it "lobbying," but that's a fuzzy and thoroughly antiquated term. It is impossible to operate a business, or even a household, in the U.S.A. without government relations. The government specialists of the American Meat Institute are among the most efficient and effective in this nation. I happen to know, too, that they have exceedingly modest expense accounts.

Here, again, our trade association has worked on a concept of faith, integrity and Golden Rule. This may sound impossible, but go down to Washington and check on them. Ask the White House, the Congress, the Department of Agriculture, the Department of Commerce if AMI means to them sincerity, dependable statistics, sound economics, keen social vision and a splendid fund of human relations techniques. The answer will be "yes" in every instance.

This, too, is the slow, steady development of respect and confidence that can be built only through a program of integrity over years and decades. The result is better government relations and public appreciation for all segments of the industry and for every member of it.

Do you think this team hasn't fought your battles? Look up the newspaper reports on the hog meeting in Washington this October 7. Think back to the cost transfer of federal meat inspection from packer to federal payrolls, a matter of \$12,000,000 per year.

Through it all, the routine services go on. Perhaps you regard them as routine. But what, for instance, of the small packer who was getting ready to spend \$25,000 on some new rendering equipment when one of AMI's operations experts dropped in on a so-called routine visit. The expert took a long look at the old equipment and snorted, "What's the matter? You got money to burn? You don't need new equipment if you run this plant properly." He reoriented the whole operation then in an hour's lecture.

Seven years later that equipment was still doing yeoman's service, and the firm's business was doubled. That was routine service at AMI, \$25,000 worth. A search

of the correspondence files of the Institute's plant operations division would reveal a multitude of similar incidents. More than 1,000 requests for help on technological and engineering problems came into this office by mail, telephone and telegraph each year.

Teaching is another routine service. Through the Institute of Meat Packing at the University of Chicago, AMI's correspondence courses have trained more than 11,000 men and women for better jobs in our industry. In the process, they developed a series of seven textbooks that, in the estimation of professional educators, is among the best reference and teaching material developed by and for any American industry.

I could go on mentioning numerous other accomplishments of the AMI and members of its staff. It would put a serious strain on many of us to keep up with Al Davies, George Lewis, Norman Draper, Vern Schwaegerle and a number of others.

Before signing off, it might be in order to touch on some things that the AMI cannot do. It cannot do anything directly or indirectly that would be construed by the government or the public as price fixing or savouring of connivance in any way. In deciding how far we can go along these lines, we must be guided by the opinions of our legal committee.

The Institute cannot inject itself into the management of the business of its members. It can and does furnish a wealth of information that can be very helpful to each individual company. It can and does, as I have pointed out, aggressively work on broad programs that help to create a favorable climate for the industry, but it cannot dictate or even suggest what prices its members should pay for livestock, at which prices it should sell its products or where it should buy or sell. It is strictly up to each member to make these decisions himself, using the information that is available from the Institute, the government and other sources.

I hope you will not get the impression that I believe our Institute has reached the peak of perfection. What I have tried to point out is the fact that, starting from scratch 50 years ago, which is a relatively short time, we have built a trade association that has done and is continuing to do a most creditable job for the industry.

Our budget is modest, very modest as budgets go for such organizations. Right now we have a big job confronting us. Pork is plentiful; hog prices have sunk to a level that is commanding national attention. Some politicians see an opportunity to make political capital out of it. Many of us feel that there is a real opportunity for the AMI to render a constructive service to the producer, the consumer and the packers by launching a powerful pork advertising and publicity campaign.

We have it in our power to move this tremendous supply of pork into consumption during the coming year by doing a selling job and to take the pressure off the government to take steps that will cost the taxpayer millions of dollars and will not solve the problem. Such a program will take more money, a lot more money, but a dollar spent for this purpose now, when it can do so much to ease the strain, will be worth many times what a tax dollar will if the government takes on the job.

You may be sure of one thing. Your AMI will continue to serve the industry with increased vigor during the years to come.



FROZEN MEATS PANELISTS Paul A. Goeser of Swift & Company; Leonard Berkowitz of L. B. Darling Co.; D. B. Love, Armour and Company; Glenn R. Curtis, IGA; Robert L. Graf, Quartermaster Food and Container Institute; Moderator John Mock; N. L. Chaplicki, National Tea Co.; H. J. Nissen, Terminal Refrigerating Co., and Miss Grace White, Family Circle Magazine.

Consumer Frozen Meats Are on the Way

MODERATOR MOCK: The first question to the members of the panel will concern merchandising and the consumer. In the opinion of the panel, what percentage of fresh meats sold retail will be prepackaged, quick-frozen in three to five years from today?

GOESER: We have such a tremendous total volume of meat sold fresh that even though the packaged frozen food item goes well in the next five years, percentage-wise I don't see it being more than 15 or 20 per cent at the very most.

BERKOWITZ: I will go a little bit higher and say that within three years 12 or 15 per cent of the meat will be sold in packaged, frozen form and this will increase to 30 to 35 per cent within five years.

LOVE: In three years the volume might possibly reach 10 per cent, and in five years, 15 per cent. We have to make a terrific amount of headway to do that.

CURTIS: I don't believe this is going to be a revolutionary change. I think it will be an orderly evolution, and we shall do well if we can get in between 12 and 15 per cent of our tonnage within the next three to five years.

GRAF: I would be inclined to agree with Curtis.

CHAPLICKI: We know from our experiences in selling frozen meat we have already reached the figure of 5 per cent of total retail sales in one group of stores that is now selling a complete frozen meat line. Therefore, it seems to me that we can look for somewhere between 30 and 35 per cent in three years, and I believe as much as 50 per cent in five years.

NISSSEN: This is the last major food industry to recognize the fact that we are on the way. Few realize that frozen meats constituted a major portion of Birds Eye sales in the '30s. For cabinet reasons and others, largely because of the advent of the war, the thing was dropped altogether. This business has a tremendous potential, and, if we may project it over a longer span than five years, I think everyone in this room will be proved a pessimist as to the ultimate point that it will reach.

MISS WHITE: The convenience foods are definitely on the way if the acceptance of prepackaged fresh meat cuts is any indication of their popularity when they are frozen.

MODERATOR MOCK: Regardless of the percentages expressed, I am sure you all agree that it affords a very enticing market, and one that is well worth consideration. With that background to start us, we will go to the second question. Would you express your opinions on what meat items have the greatest acceptance by consumers in the frozen package form?

MISS WHITE: Once again the magic word "convenience" comes to my mind, and of course, chopped meat follows. There is more of that sold in retail outlets than any other one type of fresh frozen meat. Others would be convenience items such as chops and steaks, cutlets, etc.

CHAPLICKI: I would agree with Miss White. Our largest sales of frozen meat items as we know them, that is, frozen fresh meat, are in the cube steaks, chip steaks, flake steaks and, of course, hamburger patties.

MODERATOR MOCK: Our next question is what is the best means of distributing frozen food—broker, distributor or packer sales force?

LOVE: I think it depends entirely on the makeup of the market and the specific organization in the field. For example, the San Francisco market on frozen foods is definitely a distributor's market, and elsewhere, such as in Denver, it is not. We use all three methods of distribution depending on the makeup of the market. We must remember that packer salesmen are basically fresh meat people, and, in that connection, they are confronted with many everyday sales and marketing problems on fresh meat.

On the other hand, distributors are basically frozen food people, and they are equipped, both sales-wise and distributor-wise, to do a good job in marketing frozen foods, and that could include meats. However, distributors are not meat people, and they are not too well

informed on everyday marketing practices. Therefore, when one works through a distributor, it is necessary to work very closely with him and instruct him on the proper marketing approach on meats. Distributors normally operate on a 15 to 20 per cent markup on most basic frozen food items and, there again, when using a distributor on frozen foods, we must work very closely with him on the important markup problem.

Meats, after all, are much higher priced than most basic frozen food items, such as peas and vegetables, concentrates, etc., and a distributor must take that factor into consideration if he hopes to distribute meats in good volume and with good turnover at the retail level. He cannot apply, in my opinion, a markup that will place frozen meats in a category too far out of line with related fresh meat items.

Brokers or sales representatives, I feel, can have a very important place in the marketing of frozen meats. I know several that we work with in large markets that have large staffs of in-store merchandising people who have the time and the opportunity to work at store level on the important problem of moving the products out of the store. The frozen food distributor and broker have already proved themselves to be vital links in the merchandising and marketing of frozen foods, and I think they can also do the same for this growing frozen meat business.

CHAPLICKI: We believe that, with improved truck and transportation methods, the bulk of the business in consumer packaged frozen meats will be done with the same people we are doing business with now. Brokers and wholesalers will play their part as they are now doing in the distribution of some fresh meat.

MODERATOR MOCK: You don't foresee any great difference in distribution?

CHAPLICKI: Very little.

CURTIS: I would like to go along with that as far as the large independent groups are concerned. We expect that, as we get into more packaged frozen meat, there will be more business with the same people with whom we are now doing business.

FRED TOBIN: Tobin Packing Co., Rochester, N. Y.: This is a new addition to the meat packing industry. Retailers don't have the frozen facilities to take care of frozen meats today. They are going to have to increase

their cabinet space many times in order to do anything like what some of you gentlemen are talking about, that is from 30 to 50 per cent. Possibly some of the chains are going to be able to take care of such business, but the independent retail dealers will have to change their methods entirely, especially the meat markets. I am not a pessimist. We are in it ourselves, but it is slow. I think it is going to take some time to get frozen, packaged meat to 15 per cent of the volume of meat sold to the consumer.

CURTIS: I don't think this is going to be quite as severe a problem as Mr. Tobin has indicated. We have found it is a question of what we call operation turnover, or stocking the merchandise that turns fast. It is not going to be a question of more cases. It is going to require the same amount of cases—but a conversion to low temperature cases instead of our present self-service type. It is possible that the type of case we are now purchasing and installing in our stores can be converted, with a slight changeover, into a frozen meat case. I don't think it presents any insurmountable problem.

NISSEN: I think it might be timely to comment on a figure that was given by Murray Yonker of Certified Grocers. Meat sales were more or less immaterial in their line until this past year. Between a year ago and now, their sales in meats have jumped from 4 to 10 per cent of their total, and they are multi-million dollar distributors of frozen foods. On distribution, I would disagree with the retailers here. I have watched this frozen food thing ever since its inception. I have seen the marketing of the citrus crop completely revolutionized.

Poultry has gone through the very same phase that the meat industry is going through at the present time. Ten years ago the poultry merchants said, "This will never happen." It has happened, and it has happened through frozen food distributors.

After meat in the frozen state emerges from the shell of being a specialty and becomes an accepted item, I would predict that a major portion of meat distribution will go through ultra-efficient, low-cost, frozen food merchandisers. Packages will have to be standardized, and catch weights eliminated. It will be just another item on an IBM machine in an ultra-efficient frozen merchandising system.

CHAPLICKI: I believe I allow 25 per cent of the frozen food merchandise to be sold through wholesalers and distributors. I believe I said 75 per cent from producer direct to retailer. At the present time frozen, cut-up, eviscerated poultry amounts to 40 per cent of all frozen foods sold in our stores. Draw your own conclusions.

LOVE: I want to come back to this subject of selling by distributors' and packers' salesmen. I concur with Chaplicki that we will sell direct to chain store and voluntary warehouses. That is the normal pattern of selling in the frozen food industry today. However, there is a definite group of retailers who, I feel, must be serviced through distributors, and those, of course, are the retailers it would be difficult to reach from our own packer branch house.

HAROLD FEINGOLD, Miller Super Markets, Denver: In listening to this panel talking about frozen meats, and the percentages that we have heard quoted, I feel that some of these figures pertain to certain areas in this country. I hope they do, rather than generally. We all



IT'S GONE PRETTY FAST might be the reflection of industry veteran Frederick M. Tobin of the Tobin Packing Co., Rochester, N.Y., as he receives his gold service award.

know that the meat business in supermarkets consists of 25 per cent of the volume. If, after five years, the frozen meat business is at a 50 per cent level, that means that we would be selling about 12.5 per cent of our total volume in the frozen state, considering meat alone.

I think we will all recognize the fact that we, as supermarket operators, have a problem insofar as rentals are concerned, space allocations, etc. With the frozen vegetables and fruits an up-and-coming factor, their volume also is going to increase, and we are going to have to have more space in our stores. At the present time, we have stores with as much as 40,000 sq. ft. We are going to have to maintain the supply of fresh meats and the displays that we now have in order to take care of the customers who don't have freezers. After hearing that in five years we are going to be up to 50 per cent, I am at a loss to know how we are going to be able to merchandise a complete line of beef, lamb, veal and pork in the frozen state, and also merchandise the same items in the fresh state.

BERKOWITZ: It is my feeling that such a situation can be handled much more easily than this gentleman put it. In the first place, you are going to have less back room space for packaging meat. You will likewise require less equipment for fresh meats. I do think that to begin with a good deal of this meat will have to be shipped into the warehouse with three or four deliveries a week, as necessary, so that merchants can draw from the freezers and will not need large cold storage space at the beginning. Therefore, if they have a big run on a Friday or Saturday, they can have a shipment on Friday and Saturday, delivered by refrigerated trucks to their stores.

FEINGOLD: This Friday and Saturday delivery is a very expensive type of operation. In large supermarket chains we feel we would prefer to use our own central warehouse rather than be sending merchandise to the stores, due to the cost factor.

CHAPLICKI: I believe we are going to go through a period when we operate two types of meat markets, one frozen and one fresh—until the time when the frozen takes over the fresh entirely.

MODERATOR MOCK: Mr. Graf, from your position as a quantity and an institutional type of buyer, I wonder if you have a suggestion on this question: Do packaged frozen meats offer any opportunity for opening up new outlets for meat products through institutional users, resort operators and soda fountain operators? What is your opinion on opening up new outlets through institutional users?

GRAF: I am with the armed services research and development and, of course, we are representative of large users of products. To get our products overseas, we freeze as much as we can. Without a doubt, we certainly are going to open up new markets, especially with these precooked frozen foods as well as the straight frozen fresh items. I think the delicatessen type of operation, short-order lunch counters alone, would be able to handle, with the same amount of space, a greater variety of items and a larger volume of actual business.

MODERATOR MOCK: Miss White, from the consumer's point of view do you have any comments about opening up new outlets for frozen meats?

MISS WHITE: I will come right back to the same magic word, "convenience," because that is a magic word



ATTENDANCE at all 1955 sessions was exceptional.

in all phases of the food industry. In our contact with consumers, we find they are asking for such things as a school lunch package and also a dinner package that can be served to children who have to eat before the regular family meal. For small children, mothers are asking for very small cuts of meat, such as lamb chops or small cuts of beef. They are interested, too, in meat loaf or casserole dishes, anything that is speedy but good. Remember, quality is very important.

LOVE: In our company we have been expanding our production of prefabricated packaged meats for the restaurant and institution trade. The experience we are gaining in ageing and cutting and freezing these cuts is being utilized in the processing of frozen meats for home use. About a year ago we made a movie, "Fresh Frozen Meats," for the food industry, which gives a really up-to-date account of the production, distribution, handling and quantity cookery of fresh frozen meats. The quality, convenience and economy advantages, which more and more restaurant operators are coming to appreciate, are just as pertinent, in my opinion, to the housewife shopping for meat.

CHAPLICKI: I think we have a good indication of the future of consumer size packages of frozen meat in our present ice cream sales. Ice cream is sold in many, many outlets: People are still selling a lot of ice cream in large retail stores, but so are the corner man, the man up the street and all the smaller outlets, including the man who rides around and peddles ice cream from a wagon or truck.

I think frozen meat will find its way into many, many more outlets. This may create a problem for the larger retail stores, but I think when the time comes we certainly will have the answer. We did have the answer on ice cream, and I am sure we will have it on meats.

MODERATOR MOCK: What effect will freezing of Prime and Choice red meats have on distribution of the lower grade red meats—that is, Good, Commercial and Utility grades?

GOESER: Our meat distribution throughout the country today is based on a wide variety of beef cuts available to the consumer. I see no reason why, in the freezing of Prime meat cuts, we will influence the sale,

whether fresh or frozen, of any other grades. It simply means that through frozen meats we have a sale for that particular item.

MODERATOR MOCK: Will prepackaged frozen meats put a new or higher premium on packers' brands?

BERKOWITZ: It is my feeling that there can be no premium cut on any type of frozen meat at the present time, nor will we move forward and have a higher ratio of sales. I believe that packers' brands will be here for only a short time. With the central processing and general acceptance of frozen meat, it is our belief that the future lies in private labels, so that the merchants will be able to work on the markups that they desire and deem necessary.

It is also important that stores (and supermarket operators will bear me out) be able to maintain their own rich individuality in meat merchandising. Meat is the bait that draws people into the stores. Therefore, if we have three or four stores next to each other, all merchandising the same brand of meat at the same time, there will be a tremendous problem.

MODERATOR MOCK: Will retailers have to take a lower markup in handling prepackaged frozen meats?

CHAPLICKI: We think definitely, yes. At the present time it costs from 11 per cent up to operate our meat markets. Two-thirds of the percentage is for the meat cutter and personnel wages. I think we can share a part of that expense with the consuming public by working and selling frozen packaged meats at a lower markup than we now need for fresh meats.

BERKOWITZ: I agree most heartily. I would like to see such a policy carried out in the stores now handling frozen meats. From what I have seen and noticed throughout the country, the markups are more than they are on fresh meats, whereas the cost of handling frozen meats is lower.

CHAPLICKI: I will have to agree with Mr. Berkowitz, but you must remember that the frozen meat line is new to the retailer. Let's compare it with the frozen pot pies sold by the grocery department at no markup at all. I think the time is coming when we will start selling some of our pre-cut packaged frozen meats at much lower markups than we do now.

CURTIS: I think Mr. Berkowitz is absolutely right. In too many cases throughout the country, we are taking too much markup on our frozen packaged meats. I think experience will teach us that we can afford to sell that meat for less and share part of the savings with the consumer.

MOCK: Can frozen prepackaged meats be cooked without defrosting?

MISS WHITE: All research that has been done to date points to a definite "Yes." Such cooking seems to create a better finished product; it eliminates the loss of valuable flavorful juices; it helps to eliminate much of the error on the part of the homemaker who thinks she may want to conserve a cut after it has partly defrosted and puts it back in the refrigerator again.

I would like to make one very strong plea on the part of the homemaker. It is to point out your industry's responsibility to do a good, sound research job so that you can come up with clear, concise, simple directions. We must have a strong, continuous educational program to help Mrs. Housewife. If the industry could get together on one basic set of rules, it would be fine. Many prod-

ucts have different directions, which only tends to confuse Mrs. Consumer. After you have developed the proper ways to cook your products, send them to the editorial people. We can serve you well in telling her just how to cook the food properly.

MODERATOR MOCK: Do you think the homemaker must be re-educated on her meat cookery methods before prepackaged frozen meats will really catch on?

MISS WHITE: Yes. It opens up an entirely new field.

MODERATOR MOCK: Still at the consumer level, here is a question that concerns you, Mr. Graf: Will there be a reduction in marketable cuts of meats in the development of prepackaging and marketing of frozen meats?

GRAF: From the Armed Forces standpoint, we know that the fewer units of product we have to inventory and handle all the way through distribution and issue, the better off we are. For example, in our boneless beef in the past we have grouped the cuts as they are removed in boning and trimming into various categories, such as roasts and steaks for dry cookery, the same for moist cookery and then braising and dicing meats.

We are currently studying pre-cut meats—the kitchen-ready boneless beef products—and we plan to go down the line through the other meats. We hope we will come up with no more than six divisions of the boneless meat of the carcass to work with in our distribution system.

It is acknowledged that one of the pressures on merchandising at the retail level is cabinet space. I think one of the first problems would be for the meat man to stock in his cabinets an adequate variety of meat cuts. Rather than handle half a dozen beef pot roasts, he will select one or two pot roasts, or maybe just one pot roast. After all, it is beef pot roast in the home. The same goes for oven roasts. He will select a minimum variety and will save cabinet space. Also, I believe it will be a lot easier to educate the housewife who has had her chief consultant, the butcher, taken away from her. It will educate her on how to cook pot roast and how to handle it, regardless of where it comes from. I think we can develop confidence in the product that way.

CHAPLICKI: I don't disagree with Mr. Graf. I think I agree with his caution, but I believe we will have more items in frozen meat, not fewer. I think the caution comes in at the point that we must be careful that the meat packer stays out of what is known in the meat trade as "trick cuts." I don't think there will be a place for them, although some of them might sell temporarily. We do know from our experience that two cuts that are not generally known in retail meat markets turned out to be the best sellers we have in frozen packaged meat. One item is the top sirloin, and the other is the boneless butterfly pork chop. Both items are used by many hotel and restaurant suppliers, but very seldom can they be purchased in a retail store. Such experience indicates more cuts instead of fewer.

MISS WHITE: May I add one thought to that: standardize the terminology with regard to the type of cut in the package. In our work we find it very hard to explain in our recipe copy just what we mean by some names. In Boston a rump steak is a very delicate cut. In New York it is a less tender cut. I don't know how you are going to do it, but that is one more problem.

MODERATOR MOCK: Can frozen, prepared meats,

such as sausage, be marketed either in a frozen or thawed-out state?

NISSEN: You are entering on dangerous ground if you market a product, which the packer packs as a frozen one, in a thawed state. You will always find retailers who have a minimum amount of cabinet space. If, even by inference, the salesman tells the retailer that he can merchandise the product in a thawed state, you will find that he will handle not only that item but something similar in a thawed state. The whole frozen food business will suffer. If the packer packs it to be sold frozen, it should be held frozen all the way through.

GRAF: I certainly would go along with that 100 per cent. I think the industry would be going in the wrong direction to think about freezing maximum quality into the product in the plant, distributing the product frozen and then allowing it to be marketed in the thawed form. We aren't always assured that that product is going to be moved expeditiously. As soon as the product is sold, we know it loses quality rapidly if thawed. Certainly, I believe that to make frozen meats a success, we should encourage the freezing and retention of freezing right up to the point of entering the housewife's kitchen.

NISSEN: I think another point might be mentioned here. The housewife buys in two ways: She buys convenience items for use that evening, and she also buys for her own home freezer. If the package says or implies that it is a frozen item, she is likely to keep it for a matter of weeks or months. If it has had a degree of thaw, then we get into loss of bloom, flavor, moisture, etc. You are aiming for the second market as well as the first.

MODERATOR MOCK: What are the pitfalls to look for in freezing and packaging fresh meats?

GOESER: The first thing that we have to consider in freezing and packaging fresh meats is that the product itself be in the right condition. We can't start with something poor and then hope that processing is going to make it better. The second thing is that the meat must be frozen quickly and, in freezing it quickly we are thinking in terms of retaining all the good qualities we have in the product. Packaging is a part of the picture because we need something that is moisture-proof and, as nearly as possible, oxygen-proof. As a matter of fact, we would like to have most of the air exhausted from the package if we could.

In addition to these requirements, the packer must hold the product at low temperatures. When we talk of low temperatures, we are thinking in terms of temperatures below zero and not above zero. We know that our greatest loss in flavor and appearance of these products is almost always tied in with high holding temperatures or high freezing temperatures. The product itself, as meat, can be held frozen and does have good storage life if it is properly handled.

MODERATOR MOCK: Will freezing cause a loss of flavor in the spices and flavors added in meat products?

GRAF: We have done some work in the Food and Container Institute on determining storage quality of many sausages and some of cooked items. I would say generally that you have to be careful of certain flavors because the taste of some will be accentuated and some will lose their flavor gradually throughout storage. Certain of the spices, if properly selected, will add to the preservative quality. We know that whenever we add

salt at certain levels, especially at the higher concentrations, we contribute to lower storage quality.

CHAPLICKI: If it is important to draw out the air, or vacuum pack, in order to hold weight, it certainly is a very important thing for the retailer because the weight must be as marked on the package. If we do not have the proper wrapping material that will retain the weight, then the packer must allow for normal shrinkages so, when Mrs. Consumer buys the item and it is marked 16 oz., it must weight 16 oz.

MODERATOR MOCK: Mr. Goeser, do you have a comment?

GOESER: If moisture-proof films are used, and there are a number of them available, storage tests have shown that over periods of many, many months we can expect to get only a few tenths of a per cent loss in weight of that particular product. If the product is mishandled along the way, some changes may occur. You may get greater loss but certainly that small loss is the expected one when frozen foods are handled as they should be. Our weights, as a result should be there, and should be kept during the entire distribution system.

MODERATOR MOCK: Do packaging and packaging materials pose any special problem for a packer about to enter the frozen meat business?

LOVE: I have always felt that packaging is the number one factor in handling frozen meats. In our company we use cellophane, pliofilm, foil and waxed paper. It all depends upon the type of products we are working with and the price of the product in many cases. They all work well. The important thing, I believe, is a close adherence of the material to the meat. You may get that by tight wrapping, of course, and also by vacuum packaging.

I don't know how far we can go on packaging with a lot of glitter and glamour for these frozen meat products. After all, we are working with a basic food product and not a perfume.

NISSEN: I cannot let this subject of packaging go by without commenting on another aspect which is so frequently forgotten at the packer level; that is the external package. The packer must realize that this product is going to be stored, whether in his own warehouse, in a public warehouse, or in A & P's warehouse. Therefore, the ability of a package to sustain weight vertically is of utmost importance, and it is frequently forgotten.

A glamour package is put up in a carton which really isn't much more than a paper bag. It attains vertical height in the warehouse and is squashed. That money is wasted because the product is mashed and lacks eye-appeal. Don't forget the outer package, Mr. Packer!

CHAPLICKI: I would like to add that we are protecting meat at the present time. We protect it for freezing. We wrap our meat simply because of the change of temperatures. If it isn't wrapped properly, we get into some trouble. It seems to me that on the frozen packaged meat of the future we will have two wraps, one wrap primarily to protect the meat and an outer wrap featuring a picture of the meat. The latter will be the wrap that will sell the meat just as it sells canned peaches, canned pears or chicken today. The difference in cost between a beautiful over-wrapped package and one not so beautiful is so small per wrapper that I don't see how the packer can do without it.

MISS WHITE: That is a point I wanted to bring

out, too, that one of the major reasons why Mrs. Consumer doesn't want any packaged meat is because she misses the personal contact with her meat man. He is really her best friend. The package is your introduction and it is your salesman, and your package must please her. I think that it would be very wise if you packers took a lesson from the frozen fish people who, when they were packaging uncooked fish, first had a picture of a beautifully cooked fish on the package. It was very misleading and many women bought that package thinking they had something cooked. In fresh meat you have the advantage of wonderful red color, and you can do a perfectly beautiful job of photographing just what is inside the package.

BERKOWITZ: There is only one difficulty which I see in what Miss White has just told us. When you take a picture of meat and put it on the cover, you cannot always be sure that the meat inside the package will look like the cover. When a customer opens up a meat cut that has been in there three, four or five weeks, that meat will not resemble or look exactly like the picture on top of the box. Therefore, she will be disappointed before she even tries the meat. She will think there is something different or wrong with that meat. That is our experience.

CHAPLICKI: I don't believe that is the case with canned peaches and so many other items that are sold in a sealed can with a beautiful picture. Certainly, inside the can the product usually does not do justice to the picture.

MODERATOR MOCK: Miss White, have you any experience on how successful frozen cooked meats are at markets?

MISS WHITE: As a whole, they are very successful. I think one of the greatest drawbacks is quality. Some Meat pies now marketed, for example, don't contain the amount of meat they should. I think Mrs. Consumer is perfectly willing to pay a little more to get a product which answers her family needs.

CURTIS: I quite agree with Miss White. I think that too many of our frozen pies have lacked proper quality. It doesn't take Mrs. Housewife very long to find it out. Retailers have no trouble getting acceptance for good quality merchandise. We are selling a lot of certain types that do win consumer acceptance. As a matter of fact, some of our frozen beef pot pies sell just about as fast as you can give them display space, but our great lack in that type of merchandise has been quality.

NISSEN: I think a note of caution must be added in merchandising cooked foods, and that is that the temperature demands for cooked foods are greater than for most other foods. We might say cooked foods and juices make ultra-low temperatures mandatory. A casual attitude on the part of the retailer in handling these products may lead to serious trouble.

MODERATOR MOCK: What are the suggested minimum needs or requirements to enter the frozen food and meats field, and what is the cost of these needs?

BERKOWITZ: The question of costs cannot be answered merely by stating figures of dollars per hundred-weight. There are guides and indications, however, that represent honest evaluation. Take refrigeration equipment costs for freezing meat; they can be estimated at \$2 per pound of daily capacity if the daily capacity is 10,000 lbs. or more. Anything under that figure makes the cost

rise sharply. There are other things you must take into consideration such as storage space. You must have inventories of three or four weeks supply of meats.

LOVE: It varies greatly with the type of products you want to produce.

MODERATOR MOCK: How will changes in consumer buying power affect the market for prepackaged frozen meat?

CHAPLICKI: I don't think very much. Of course, we know our frozen packaged meat today is high-priced and that might have its effect. I think that we will have to live through a time when Mrs. Consumer will think that she is paying more for her meat than she should. I believe she may be right in some cases about the prices that I have seen in some stores. However, I think all those things will find their level and will straighten the price structure out to the point where Mrs. Consumer may possibly pay a slightly higher price for pre-cut, packaged frozen meat. However, there is a problem and a lot of people believe it can be done for less. She will get more meat for her money than she is now getting, even buying at lower prices.

MISS WHITE: I agree with Mr. Chaplicki. You will always have a steady loyal following on the cuts with which the consumer is familiar, such as steaks and chops. Cuts such as boned roasts pose another question. I think it necessitates a good continuous educational program, and, when the housewife learns that the brand name on the package denotes the quality that she has found in it, I think half your battle is won. However, it is a long process.

MODERATOR MOCK: Mr. Goesser, Miss White has brought up a point on which you may wish to comment. Is the sale of quick frozen, prepackaged large roasts a practical thing?

GOESER: I think we are actually not yet capable of commenting on it. We do know that the size of the roast boneless and the size of the roast with the bone in are actually two different things; what you might actually classify as a large roast with bone in, something at the 6- to 8-lb. level, may be sold boneless at the level of 3 to 4 lbs. I think it is going to be a matter of consumer research that will eventually establish how large a roast is wanted and how large a roast can be packaged for retail sale.

From the technical side, we feel that a roast can be packaged for the consumer at almost any size that she will eventually desire. What she will desire is the thing that has not been completely established.

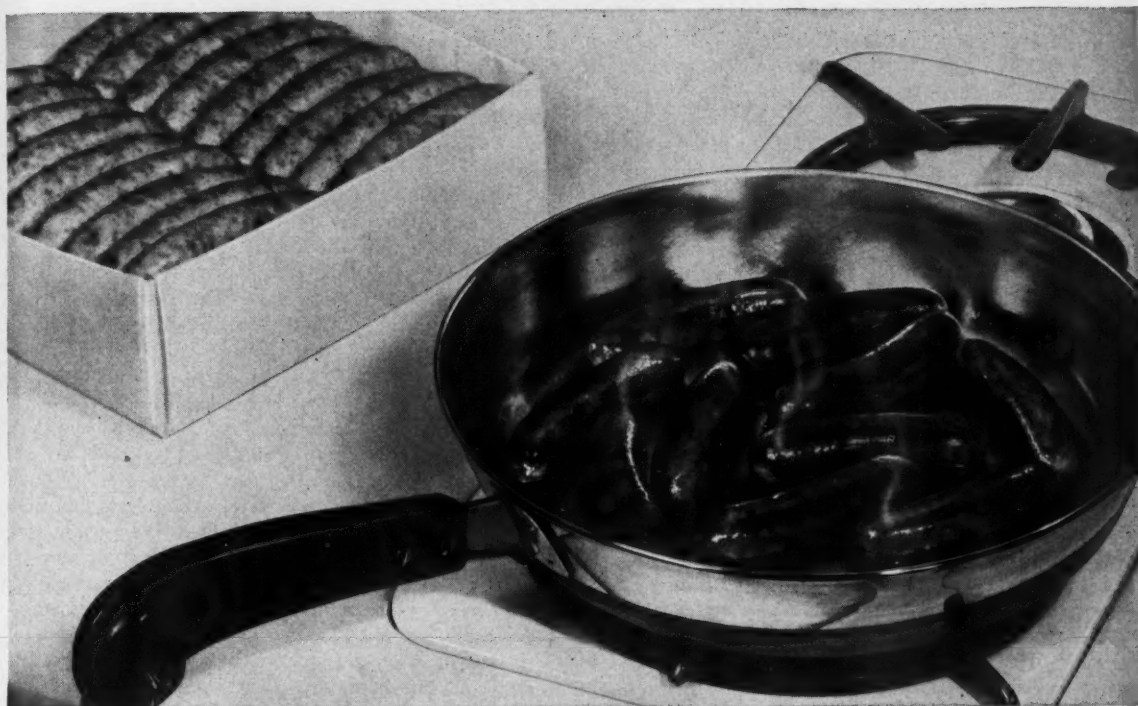
MISS WHITE: It is a consumer education program. I don't think the average consumer realizes that the edible portion of a two-rib roast of beef weighing 6½ or 7 lbs. only averages 3 or 3½ when it is boned. That is something she must be taught through education and through use of the product.

NISSEN: The poultry industry went through this transition. Some of the top poultry men in the country said "Madam Housewife will never pay 70 or 80 or 90¢ a pound. We must sell it New York dressed." They were then selling a great amount of inedible. They have conquered that and the meat industry will, too.

MODERATOR MOCK: What is the storage life of prepackaged frozen meats?

NISSEN: First, possibly, we should define storage life. You ask the average person in this room what is meant

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by storage life and he would say the time the product spent in the base freezer. Storage life for a consumer package is different. Storage life is the period between the time the meat leaves the tunnel freezer and the time it gets onto the housewife's table. During that span, there are bound to be some variables. Minimizing those variables is a very important factor in preservation of quality.

This subject has been of sufficient importance to the general frozen foods field to cause construction of a variable temperature laboratory by the U. S. Department of Agriculture. They are studying the effect of controlled temperature variables on the life of vegetables, fruits, juices and other items over a period of one, two and three years. It is a known fact that distinct temperature variables in the early life of a product are more important than in the later life. In other words, if a product is kept six months and, in transportation, it goes from sub-zero up to 25° and then is brought back down again and held there for a number of months, the chemical actions that are started when the temperatures went up, have a serious impact.

If the temperature variation takes place toward the end of its life, it is less important, but it is still mighty important. We have a real job to do on the maintenance of low temperatures all the way along the line from the plant to the consumer.

GOESER: When we talk of storage life, we certainly must keep in mind the fact that the storage life is lessened by each degree, literally speaking, of increased temperature that the product experiences any time during that storage period. To have a long storage life, and by long I mean anything upward of two months, or even upward of one month on some pieces, requires that you think in terms of temperature of 0° or lower. It is very easy in a 20° temperature, just as an example, to impair color and flavor of hamburger in less than a month of storage time.

GRAF: Very definitely, as was indicated by the other two members of the panel, there are many factors that contribute to storage life: the initial quality of the material, the way it is treated all the way along the line, and many other variables. When one is endeavoring to determine the storage life, it is dependent upon these many factors, and each of them must be considered in such a determination.

MODERATOR MOCK: I want to give the opportunity to the members of the panel for a final word of comment with regards to frozen meats.

GOESER: There is no doubt in my mind that the consumer will eventually decide where the frozen meat game is going to go. The quality of the products that the packer and the distributor and the retailers finally put out will be one of the very important things that will make up her mind.

BERKOWITZ: I concur with Mr. Goeser. I heartily believe in the future of frozen meats. I have lived with them during five years and I believe that the more we get into the business the better off we are and the more brands we have in the case the sooner the items are going to sell.

LOVE: It isn't necessary at this stage to forecast the future of frozen meats. They are here. There are very few statistics available on the sale of frozen meats, of

course, but I would like to refer to a USDA survey that was made in the city of Washington in 1954. This indicated that even at that time meats were second in gross sales per unit of case space occupied. Meats were second to concentrates occupying 18 per cent of the case space, at \$1.46 return per sq. in., with meats coming along in second place with only 2 per cent of the space, 3.2 per cent of sales, and .93 return per sq. in. Those figures should give all of us here at this meeting something to think about.

CURTIS: I think that you will find the evolution will proceed in an orderly manner and the case problem will solve itself. When we went into self-service meats, if we had 30 ft. of service meats, we didn't add another foot. We took ten out and put another ten in and so on. I think you will find the space problem will more or less solve itself something like this. I would leave with you the slogan of our company, which is: "Proceed hastily slowly." Translated, this means go as fast as you can but don't go so fast you don't know what you are doing.

GRAF: I would like to encourage greater consumer education on utilization of frozen meats in the home. I think it is each packer's and each retailer's responsibility to help to educate users of frozen meat. I do believe the subject needs an awful lot of additional emphasis as we move along.

CHAPLICKI: I think we have two problems that we are going to face. One is already a fact. We must learn to pre-cut, prepackage and freeze meat at lower costs. The job of cutting, freezing and packaging meats truly belongs in the packing plant, and it must find its way back there and it will. But it will only find its way back to the packer when the packer finds and uses methods whereby he can duplicate what is now being done in the retail store. For example, on a side of beef that costs us 40¢, we can cut, prepackage as we do, trim, make 18 to 20 per cent markup and sell for prices that will average less than 60¢ per pound. The packer frozen pre-cut line today has an initial cost average of \$1.52 and a retail of \$1.90. We say all those things about consumer frozen meat coming into its own, but it is not going to come into its own at a cost of \$1.52. This, by the way, is higher today with a much lower market cost of meats than the original price placed on the frozen products in May or June.

NISSEN: The merchandising of frozen meats is in a rapid transitional stage. It has been a specialty; it will be a basic commodity. The observations that my associates have just made are based upon merchandising a specialty, but as the promotional costs and capital investments are worked out, expenses will be reduced and margins will go down. The costs reflected in frozen meats tomorrow will be the costs on a basic commodity and not upon a specialty, as they are today.

MODERATOR MOCK: Miss White, may we have your comments?

MISS WHITE: During this evolution, I think your meat industry has one big plus, and that is that it is no secret as to why Mrs. Consumer has bought prepackaged fresh meats so enthusiastically, or why she hasn't bought them. If you can just take a leaf out of that book and do the things that she likes about prepackaged meat and eliminate the things she doesn't like, you are well on the road.

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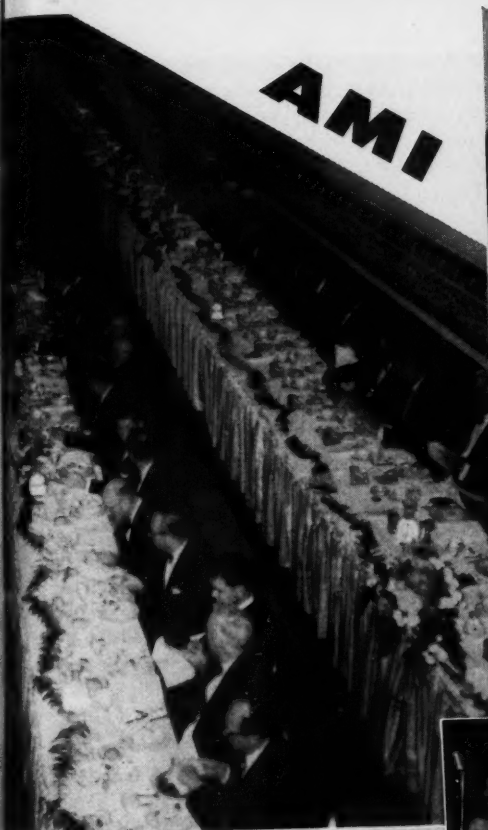
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Let's Return to Spirit of Founders

• I would like to express a few ideas concerning developments both at home and abroad that have some bearing on our agricultural industry. A few of you may not agree with all of my thoughts on the subjects covered, but I am confident that every one of us has the same general patriotic objectives in mind for the welfare and security of our country.

It has been my experience that we differ sometimes in the methods used in accomplishing certain accepted goals. For example, I am sure that every good American wants to protect the free enterprise system. In other words, we want to perpetuate free, competitive markets throughout our economy.

With equal emphasis, we should avoid embarrassing foreign entanglements. Every sensible person would agree that we should cooperate realistically with other nations but not meddle in their internal affairs nor permit them to interfere in ours.

Let's examine first some domestic problems. For the past several years I have been reading and studying reports concerning farm, dairy and meat products, to increase my knowledge of the agricultural industry as a whole. Having spent a lifetime in this business, you know that I have a terrible lot to learn.

However, you will understand my more than ordinary interest in farming, ranching and meat packing when I tell you that I am a farmer and stock raiser on a very small scale. Parities, acreage allocations and the prices of cattle and hogs are receiving particular attention in my family, just as they are in your own and millions of other families across the land. At present we have a few hogs and a small, conglomerate herd of beef cattle on my farm in Maryland. We are interested in the Santa Gertrudis breed. We have a beautiful Gertrudis bull called, of course, Ferdinand. If he will pay attention to business, we hope eventually to build up a sizeable herd.

It is universally recognized that the present Secretary of Agriculture, Ezra Taft Benson, is a man of the highest integrity, sincerity of purpose and outstanding ability. He has the real interest of the farmer at heart and is obviously striving to create conditions for farmers and ranchers alike that will place them on an equitable basis with people in other segments of industry. I am con-



GEN WEDEMEYER

vinced that Secretary Benson is not one iota influenced by political expedients but is honestly striving to re-establish a free, competitive market in keeping with the American tradition.

The Republican party received a mandate from the voters in 1952 to do exactly that. I greatly admire the loyal support that President Eisenhower has given Secretary Benson in the effort to carry out that program.

From biblical times, history records the fact that the man tilling the soil has always cherished his independence. The only paternalism that he accepts gracefully is that of God and the good earth. He staunchly maintains his right to enjoy the fruits of his own labor and instinctively resents government restraints and controls or any form of interference. The dream of independence, of liberty, dies hard in all true Americans.

Secretary Benson recognizes all of this, I am sure, but to protect the farmers' interest under present conditions, he is compelled to resort to flexible price supports and even carefully determined acreage controls. Concurrently, sound methods must be devised to dispose of our vast surpluses without disrupting the economy of our country as a whole.

In fairness, let's ask ourselves what we would do if we had Secretary Benson's responsibility to solve these problems, which would really baffle a Solomon. At least, we know in Mr. Benson we have a public servant of high purpose, who will not present a cheap and easy, but unworkable solution for selfish political reasons.

There is no substitute for men of character in high positions of government. With the 1956 elections in the offing, both the Republicans and the Democrats are trying to present a farm program by which they might win the support of millions of voters in the agricultural and related industries.

As Americans, we have a stake in every phase of government from the smallest precinct right on up to Congress and the White House. You will agree, I am sure, that our government at the various levels will be just as honest and efficient as we, the people, require it to be.

Actually, the apathy of many Americans toward politics and government is creating a vacuum, a vacuum which inevitably will be filled by the most self-seeking and corrupt elements in the country, to be specific, gangsters, communists and grafters.

President Eisenhower and Secretary Benson, and men of like caliber, deserve and need our unstinting and militant support. In spite of the President's recent illness, I feel certain that the vast majority of Americans hope and pray that he will be able physically to serve a second term.

However, should it develop that he cannot be a candidate again, a very important decision confronts us, particularly those of us who wish to insure continuity in the constructive steps outlined in the Republican platform of 1952. Not all of the goals of that platform have as yet been accomplished. The trend of socialism at home and interventionism abroad had become very strong in our country and could not, within a few years, be controlled to the degree contemplated by the Republican platform.

As the 1956 elections approach, it is evident that we must dedicate ourselves to the task of selecting, electing and supporting men who will courageously carry out the 1952 mandate of the American people—namely, to pro-



protect our free, competitive economy, to limit the power of bureaucratic Washington, and very importantly, to conduct our international relations on a realistic "America First" basis.

In referring to international relations, it is a sad fact that we Americans who have been traditionally dedicated to the freedom of the individual, freedom of thought and expression, freedom of opportunity, have unwittingly, in some cases knowingly, given real assistance to the Communist program of world conquest. We did this first, by recognition of the Soviet as a legal government; second, by releasing billions in economic and military aid to the Soviet and her captive countries; and third, by emasculating U. S. military strength after World War II while the Soviet retained stupendous forces.

Every American knows now—many knew all along—that the Soviet leaders were uniformly arrogant, uncooperative, unreliable and dishonest. We all should have known the real facts behind the so-called people's revolution under the Soviet banner. This spurious people's revolution was widely proclaimed by Communist leaders long before World War II.

It is a historical fact that the American Revolution was the real people's revolution, a revolution whose lofty aims and noble purposes were clearly outlined in the Declaration of Independence. Unlike the French and the Communist revolutions, the American Revolution led to no excesses. Our founding fathers wisely provided for states' rights and individual rights. They also established checks and balances with definite limitations on the powers of the federal government.

The American revolution is still in progress. Harsh in its demands for vigilance and self-sacrifice for those who cherish truth and liberty, but rich in its rewards, our American revolution continues to raise man's social and economic status to undreamed-of heights. We must keep faith with our founding fathers and the succeeding generations of patriotic men and women who have worked,

SECTION OF SPEAKERS' table at the annual dinner, and some of the other tables in the grand ballroom of the Conrad Hilton.

sacrificed, even died, to preserve and perpetuate the fundamental principles of our constitutional republic, the New World's experiment in human relations.

Let us not forget what Lenin said: "The proletarian revolution is impossible without the violent destruction of the machinery of the capitalistic state." Bluntly, this means that the Communists are pledged to destroy us.

Did the Soviet leaders, Bulganin and Krushchev, renounce that policy of "violent destruction" at the recent Summit conference? Not at all! They and their henchmen, while fomenting hatred and destruction on the one hand, call for co-existence on the other, and they seem to be enjoying success in some diplomatic quarters.

Many spokesmen of the western world have voiced a sense of relief, even gratitude. But why? Has any single aggression in Europe or Asia been abandoned by the Soviet? Just consider Molotov's recent arrogant reply to Secretary Dulles' proposals on German unification, a typical Soviet commissar's attitude.

The theory of some of our western "experts" that the free nations can co-exist with the Communists is completely unfounded and unrealistic. Peaceful co-existence between our system of government or our way of life and the Soviet way, combining totalitarianism, communism and marxism, actually means a psychological war of attrition.

So often we are told that people of different religions can co-exist. This is true because they have a common moral basis. People in different political systems and in widely divergent social organizations also can co-exist but only when they make and fulfill agreements in good faith, when they respect the dignity of the individual and not only preach but practice decency in all human relationships whether between individuals or between states.

But we have no such common basis with the Com-

munist leaders, most of whom are fanatical tyrants, unscrupulous and ambitious to perpetuate themselves in power and wholly unreliable. Because there is no common ground for compromise or friendly and constructive cooperation with the Communists, the struggle will go on until one destroys the other, not necessarily through the employment of military force but more likely by the force of ideas.

It is ironic that we Americans, the living symbols of freedom, excel in selling material goods to the rest of the world while the Communists, exponents of atheistic inhuman systems of "materialism," excel in the sale of "ideas." Stated succinctly, while we Americans enjoy outstanding success in selling our material things, the Soviet leaders and their henchmen are successful in selling Communistic ideas.

Some of our Allies, as well as a few Americans, appear ready to turn Formosa over to Red China and to give the Peking government a seat in the United Nations. And at what cost? No one can tell.

For example, do they not realize that these steps would definitely break down the morale of the South Korean army? This army of 650,000 is a well-trained force that American taxpayers' money and manpower only recently created at great effort. Worse, the loss of Formosa would undermine our security in the Pacific area by breaking the free nations' strategic chain of bases along the China Coast. Further, it would stimulate Communist activity in Japan, the Philippines—throughout the Far East. It would, in effect, hand the rest of Asia over to the Communist war lords.

Perhaps one of the reasons inspiring the current Soviet attitude of professed but unproved friendship is the increasing strength which we in the free world have been able to muster by forming such groups as the North Atlantic and Southeast Asia Treaty Organizations. The North Atlantic Organization, known as NATO, is helping to bring stability to European nations by pooling their military resources against potential aggressors and by removing obsolete barriers against economic cooperation between member countries.

However, before we join any international organization, careful consideration always should be given to the effect upon our own economy and military security. We should carefully avoid participation in local conflicts all over the world. At present we are committed to join in military action should there be conflict between two or more members of NATO.

For example, if Greece were to attack Turkey, we would be required to fight the Greeks. Both the Turks and the Greeks are our friends. Does this make sense to anyone?

Twice in the past 40 years we have become involved in the affairs of Western European countries at stupendous cost in lives and treasure with still, even today, no guarantee of peace.

Our sincere efforts to defend democracy everywhere have been uniformly misunderstood. America is "damned if we do and damned if we don't" by many of our so-called allies. When we send six divisions to Europe, we are warmongers. If we keep our troops at home, we are isolationists. How can our European friends expect to retain our good will when they first condemn us as isolationists and then refuse to do their share in the common



GROUPED AROUND annual dinner speaker General Albert C. Wedemeyer are John Holmes, chairman of the board of Swift & Company; J. M. Foster, 1954-55 and 1955-56 chairman of the board of the Institute, and Wesley Hardenbergh, AML president.

cause of security against Soviet aggression in their own front yards?

In the Far East we have a similar problem. The South-eastern Asia Treaty Organization was established in 1954 at Manila. SEATO bands together many of the countries in that area for mutual defense and economic cooperation. I believe that we should give full moral support and carefully evaluated material support to this organization. But there are teeming millions of people in the Far East who should be willing to make every sacrifice for their own freedom. I definitely oppose pouring American manhood into that area.

One serious defect in SEATO is the fact that Japan, Nationalist China and South Korea are not included as members. Yet those nations have a real understanding and hatred of Communist aggression and have given concrete evidence of their determination to resist it. Further, from an economic standpoint, Japan, Nationalist China and South Korea must have access to raw materials and to the markets of the Far East. This they would have to a much greater degree as active members of SEATO.

Obviously the United States cannot maintain its own economic stability or provide for its military security while subsidizing almost indiscriminately the economy and security of nations and peoples all over the world. Let us face up to the fact that our past policy of entangling ourselves in the affairs of other nations has caused us to betray the ideals which once brought bona fide respect to America throughout the world. We should cooperate with and give assistance only to loyal allies of proven sincerity, allies who do assume their proportionate share of the burden in opposing aggressions and in maintaining an honorable peace, and we should make certain that our aid does not go to any country that might turn against us.

May I remind you that our own American Revolution brought forth the greatest opportunity for the individual to improve his lot with dignity and with self-respect through appropriate rewards and incentives for hard work, honesty and ingenuity. It is time, I believe, that we should return to the spirit of our great American Revolution and staunchly defend against the "Tories of Internationalism" and the "Redcoats of Paternalism." Let us recover our forefathers' unflinching spirit that was and remains a radiant symbol of faith—faith in the individual, faith in our nation and faith in God.

U. S. is Back on Path of Promise

• Under the wise leadership of President Eisenhower, the American people have begun to re-establish their faith in themselves, in their traditional principles of government and to rebuild again a firm foundation for a future of prosperity and happiness. His present illness spotlights both the problem and the progress and challenges every American to carry on until the structure is secure.



SEN. BENNETT

The world has been adrift since World War I. The winds of expediency we sowed in the '20's became the economic whirlwinds of the '30's and filled the '40's with the tidal waves of war that engulfed all men and nations everywhere.

In that swirling whirlpool of fear, we not only lost our economic moorings, but, more tragically, our spiritual bearings as well. Too many of us jettisoned our faith in ourselves and in eternal principles and, driven by a sense of helplessness, grasped at the illusion that omnipotence reposed in government, or worse, in men by whom the power of government had been usurped.

Lenin and Stalin were literally deified. Hitler boasted he would set the pattern of history for 1,000 years. Even in this country there arose a cult of person-worship the vestiges of which are still present.

This pattern of an all-powerful government, personified in the figure of an indispensable man, is a barbaric throwback to the Dark Ages and beyond. It denies the validity of our great spiritual heritage and the true meaning of America. A future built upon so false a premise would be dark indeed.

Fortunately, we have leadership in America that recognizes the problem and has courage to move toward its solution by striving to restore the power of the individual citizen and to create an atmosphere in which he can solve his own problems. And, even though the time has been short, we have already made significant progress toward this goal.

Of course, there are many loyal Americans devoted to this basic American pattern who cry out that we have not moved fast enough. They can't understand why the change could not have been made overnight by edict. They fail to realize that to do this would have required the very kind of usurpation and dictatorship we seek to eliminate, and that we can build a system of responsible citizenship only slowly, moving toward our goal only as

fast as public understanding and opinion can follow and sustain us.

The central government can withdraw from power and responsibility only as fast as local governments or private citizens are ready to take up these burdens. In the science of war, withdrawal and disengagement are always more difficult than aggressive contact. There is great danger of leaving a vacuum which the enemy can exploit or in which chaos can develop.

Besides, there are still many problems created by the now discredited philosophy of an omnipotent central government which must be liquidated before new policies can be affirmatively effective. Probably the best example of this is that of the now great overhanging agricultural surpluses.

That the necessary period of painful readjustment can be short, and that private responsibility will solve the problem, is being dramatically demonstrated by the dairy industry. However, the temptation to postpone the inevitable and to hang on to a temporary short term benefit just a little longer is still very strong.

The tide of the future is stronger, however, and I am sure that Congress, having chosen to take the first steps toward a free agriculture, will not turn back but, with the support of the President and the people, will hold to course.

I'm sure no one in this audience underestimates the seriousness of the agricultural problem, but I hope that at the same time we are not overestimating it. In the face of the painfully necessary readjustment from a wartime to a peacetime volume, we must not lose sight of the fact that the income of the individual farmer is holding steady and has even risen recently.

Our proper concern for the farmers' problems must not blind us to the overall national prosperity which has been achieved during this process of the transfer of economic responsibility from government to the citizen—a prosperity which many of us believe may have been generated partly by the very government policy of withdrawal from economic controls.

The magazines and papers have been so full of the new record figures that I will not try to repeat all of them here. But some are worth remembering:

1. Gross national product approaching \$400,000,000,000, rising in three short years from a Truman high of \$358,000,000,000.
2. Peacetime employment above 65,000,000 with factory workers' wages at an all-time high.
3. Consumer personal income above \$300,000,000,000, and consumer spending above \$250,000,000,000.
4. And most significant, all these gains are measured in terms of stabilized dollars, whose purchasing power has not varied more than 1 per cent in three years, after a slide of nearly 50 per cent in the previous 15, and have been achieved without the dangerous stimulation of war.

During these three years, significant changes in the relationship of the government and the citizen have taken place, and the process is continuing. The government has moved away from its position as economic dictator toward a sounder position as a kind of underwriter of prosperity, standing ready with fiscal and monetary policies, and, in real emergencies, with direct but temporary intervention, to steady the economy.

Its chief objective has been to create and maintain to

the greatest practical extent an atmosphere in which the citizens, as free men in a free economy, could use their initiative, faith and courage to create their own prosperity. How well they have seized and capitalized that opportunity is revealed by these record figures.

These figures are all the more remarkable because at the same time the actual volume of federal purchases and employment has been significantly reduced—a program which, except for the needs to maintain an adequate posture of defense, could continue at an increasing rate.

Important as this change in domestic policy has been, it is no more important than the significant developments in the American leadership for world peace. It has not been easy to shake off the almost hypnotic influence of a war psychology which tried to mask the evils of war with the values of the temporary economic gain inherent in preparation for war, and passively accepted the threat of still another war as more or less inevitable.

This fatalistic policy of accepting wars when they might come, and fighting them on the aggressor's terms, has been rejected and, after liquidating the useless conflict in Korea, the Eisenhower administration has affirmatively won the initiative for peace around the world.

The struggle is not over, nor is our future secure, but again our feet have been set on a path of promise for the future, and a new international foundation is being slowly erected on realistic faith in the basic human urge for peace.

Before we close this catalogue of gains, we need to mark another great and most significant change in our pattern of government, a final step away from the personal symbol of power. That this had really and finally happened in America was obscured by the tremendous personal popularity of President Eisenhower.

In the minds of many, he was the personification of the present administration, and in this attitude the old yearning for a single all-powerful individual still persisted. The extent of its strength was revealed by the depth of the shock at the news of his illness. But in the weeks since, a new understanding of the President's own conception of his place in government has emerged, revealing that under his leadership our government has again become a government of laws and not of men and that his administration has not been a "court" of hangers-on around the White House, but a team that could carry on steadily and successfully in his absence.

Of equal importance is the realization that the transfer of ultimate responsibility to the individual citizen had proceeded so far and so successfully that after the first rocking shock, there was no permanent change either in direction or speed. This is almost the ultimate tribute to the ability and patriotism of a man whose personal popularity could have tempted him into trying to make himself indispensable. Fortunately, all the news of his recovery is good. He has again resumed his place at the head of the team and we all pray that he may speedily recover his full vigor.

There was a time in America, more than a century long, when we had a firm foundation built on enduring principles on which we raised ourselves from weakness and obscurity to strength and greatness. The pressures of war and its resulting economic and spiritual bankruptcy swept us and all the world off into a chaos of insecurity where we drifted for more than a generation.



Meeting our great need for wise and courageous leadership, President Eisenhower and the men of his administration have made tremendous headway in re-establishing our nation and its economy on the same sound foundation of faith and personal responsibility on which we grew to greatness.

The process has been slow and gradual—much more so than many of our impatient fellow-citizens have liked—but this gradualness is necessary because there are still many inherent problems that only time can work out. At the same time, we have made remarkable progress in three years.

As the government gradually has withdrawn from economic dictatorship and reduced its purchases, the private enterprises of our nation have more than taken up the slack. They have carried us to new record heights of prosperity.

On the international front the President has seized the initiative for peace and destroyed the myth that war is necessary or economically desirable. Great as all these gains have been, they are at least matched by the realization that he has again made the office of the presidency the source of leadership for a team and not a symbol of personal power. In these important ways he and his administration have laid a firm foundation for a future of growing greatness for America, of peace for all men everywhere, and of increasing prosperity and happiness for us who proudly call ourselves Americans.

But this is not the final answer; that lies with us. How clearly do we recognize this great change of direction? How much do we cherish the increased freedom it has brought to us? How wisely will we build on this new foundation?

We have made a good beginning, but the path ahead is not going to be easy. There will be many beguiling voices to call us back into the old pattern with the same old promises—promises that mean surrender of responsibility for us and power for them. I, for one, have no fear of the future.

I believe most Americans welcome the peace and prosperity that have come with the basic change of direction our government has taken. I believe they love their increased personal liberty and are willing to accept the added personal responsibility that comes with it. And on this belief I base my faith in America's future.

U. S. Economy Is Without Peer



DR. PHILLIPS

• Under our competitive economy, we in this country enjoy a standard of living which is the envy of the entire world. As you travel around the world, you are impressed with the fact that the most of it simply is amazed at the speed with which our economy has raised our own standards of living—and no wonder. If you go back just 50 years ago and take all the things we were producing at that time, such as kerosene lights, kerosene stoves, horse shoes and hoop skirts, and put them in a monetary value and divide this by the young and the old and the sick and the not so sick, in school and out of school, in jail and out of jail, divide it by all of them, you will find that the per capita income in this country has more than doubled in 50 years. Nothing like that has ever happened to any other country any place in the world.

We have twice as much to consume on the average today, but it isn't only goods and services. Along with this increase in goods and services, we have a growing amount of leisure time. Back in 1890, which seems a long time ago but in the life of a nation is only a day, we had a work week of roughly 60 hours. By 1912, it was down to 50. Today and in the last 15 to 16 years it has been averaging about 40. In many areas the 35 hour work week is already here. A few weeks ago several of us from around the country gathered in New York for a day to pick each other's brains as to what this economy might look like by 1965, and, as economists, we disagreed on most things. But we all agreed on one thing, that by 1965 certainly the 35 hour week will be the maximum week, and the actual week might be appreciably below that.

But it isn't only the fall in the work week. We have earlier retirements, and on pensions; the morning coffee break and, in many places, the afternoon break, either legal or illegal; more paid holidays, longer vacations, long weekends, which allow thousands of people in the winter in my area of the country to get on our snow trains and go off for long weekends of skiing in the Maine, Vermont, New Hampshire and Canadian hills. Today the average American worker, and this is something which we all too often forget, is on the job 233 days a year. He is away from that job on Saturdays, Sundays, holidays and vacations, to say nothing of sick leave or what goes for sick leave. He is away from that job 132 days a year. For every one and three-fourth days he works, he has one day away from the job. Nothing like

that has ever happened in a nation where there are still job opportunities.

I think it is so important that these increased goods and services and this shorter week are being shared not by just a few but by an increasingly growing percentage of the total American economy. You can see this in so many ways. To start with, you can look at the after-tax income returns, and you will find that for the upper 10 per cent income receivers over the last 15 or 20 years, income has been gradually going down. For the other 90 per cent it has been steadily coming up until today this country of ours has a middle class which again is the envy of the entire world. Forty-four per cent of American families have incomes between \$4,000 and \$7,500 a year. If you want to see how rapidly that is going up, go back to 1925 and take the same purchasing power then as \$4,000 to \$7,500 will give today. Only 15 per cent of our families had it. This has gone from 15 per cent to 44 per cent in a quarter of a century or a little less!

Of course, you can see it in other ways. You can see it in the spread of voluntary health insurance, and I emphasize the word "voluntary." You can see it in the spread of home ownership, automobile ownership, college education. Just 15 years ago, in 1940, about 9 per cent of the workers of the United States were covered by some form of voluntary health insurance. Today it is 66⅓ per cent. In 1940 about 40 per cent of the homes were owned by the people living in them. Today it is well over 50 per cent and rapidly going up. In 1929 we had roughly one car for every six individuals in the country. Today we have one for every 3¼ people. In 1929 we had less than 12 per cent of the college age youth in colleges. Today we have over 30 per cent, and that is rapidly going up.

Not so many years ago, as world history goes, there lived a gentleman by the name of Karl Marx. He wrote a wonderful book, a book that every American ought to read, not because you will agree with it (God forbid!), but simply because in "Das Kapital," Karl Marx set forth the basic principle of a socialistic, communistic (and there is no difference between the two in the long run) philosophy. He said under a capitalistic system such as we have, and proudly have, it was inevitable that the rich would get richer and the poor would get poorer. What a shock Karl Marx would have if he could come back to these United States and walk our streets and our country lanes today.

If you really want to appreciate this standard of living that a competitive economy has given us, you want to see it not through the eyes of an American but through the eyes of the people abroad. You want to go into some country in the East, if you want the most startling contrast, where I spent several months a year and a half ago on a little mission for our State Department. In India, for example, you will find yourself in a country with a per capita income of \$39, not a day, not a week or a month, but a year. I don't care where you get off the plane in that country, whether it is in Calcutta, Bombay, Madras, New Delhi or in the desert. Wherever you get off, you always get off in the early morning hours, because you travel on government planes and they always run them when it is most convenient for everyone but the passengers.

So, you get off early in the morning, and you get in a

broken-down station wagon to go back to the nearest city, wherever it is. It is dark. As you get closer to the city, it begins to lighten, and you discover that the roads haven't been very well made because along the sides of them are many logs. As it gets lighter, you discover they are not logs at all, but people. They are people with old gunny sacks wrapped around their heads so that when the sun comes up it won't awaken them too early. As the sun comes up, you see them throw off these old gunny sacks and go to the nearest little hydrant, and you see them wash their face and clean their teeth with their fingers.

You go on down to your hotel, wash and come out and start down the street, and you find yourself surrounded by beggars. You never know whether they are four, six or 12 years old, because they all look the same—hair matted, never been washed, little T shirts and nothing else on. They follow you down the street, and they say to you, "Sahib," in a rather whiny sort of voice because that is the voice of the professional beggar in India. "Two anahs, please." That means roughly, "Master, three cents." They say, "Got no mama, got no papa, baby hungry. Sahib, sahib!" And you make a mistake and put your hand in your pocket and pull out an anah or two, and you find that three beggars have changed to 50 before you can get your hand back in your pocket. And you go back to your hotel.

Any time after dusk you get out of your broken-down car or government car, whichever the case may be, and start to walk up the steps into your hotel, you gingerly step because you are walking over sleeping people on the steps of your hotel. But if you don't want such a contrast, come back into another country with me.

If you want what I think is the most significant contrast, you won't go to the East; you won't even go to France or the United Kingdom. You will take the contrast between the United States and Russia, for a very simple reason, because here are the two great powers of today's world. Here are the two powers literally at war in a cold war. If we ever had any doubt that the cold war would not go on, all we have to do is to live through the last week and a half of Geneva, and we know the cold war is still in its very early stages.

It was only 35 years ago that Stalin was saying publicly for all the world to hear that the real test and the purpose of the revolution in Russia is a very simple one. It is to raise the standard of living of the Russian people.

Thirty-five years have gone by, long enough, I am sure even Mr. Stalin would have to agree (although Mr. Malenkov wouldn't, obviously), to test what has happened as a result of that revolution. The result is that today the per capita take-home pay of the average Russian, if you take the industrial worker and the farmer across the board, is the same as it was in 1928 before the first Five Year Plan was put into effect.

Certainly if the test of what the Russian revolution has done for the Russian people is a valid one, it has been a dismal failure indeed.

Don't misunderstand me. I am not saying to you that this competitive economy of ours is perfect. Far from it. We have thousands and thousands of people yet with incomes far below the minimum for health and decency. We are plagued with unemployment from time to time. Despite the spread of voluntary health insurance plans, we still need more of the voluntary kind. But what I am

saying is that this competitive economy of ours, despite these drawbacks, has produced an economy which is the envy of the entire world.

It has done something else, and this, likewise, you appreciate more as you get it through the eyes of people in other countries. While the most obvious thing it has produced is the standard of living, a much more significant thing that it has done is to help us preserve and build the freedoms in this country which we so badly want.

People the world over all have lost their freedoms whenever political and economic powers have become concentrated. I don't care whether they have become concentrated in a government or in the hands of a few individuals; it makes no difference, because when these powers are concentrated and opposition develops, as it always does, those in power have only one thing they can do, and that is to stamp it out. When they attempt to stamp it out, you find yourself in the police state. It is then that people do lose their freedom of speech, their freedom of worship. They walk down the street and fear their own personal safety. They lose their freedom to select their own career, to produce and not produce, to buy and sell in an openly competitive market.

I was in a dictatorship a few weeks ago, a small dictatorship, as many of you have been. I read the papers, as you have done, which say what Mr. Battista wants them to say. I went to a political rally, as I am sure some of you have, and for a few minutes I thought it was a wonderful thing. Here, in this lovely square of the old city, with Romeo and Juliet balconies all around, and an orator up in one of them haranguing the crowd, it was wonderful.

All of a sudden I got over being taken by the orator and I had a chance to look around at the other Romeo and Juliet balconies in the square. On each and every one of them was one of Mr. Battista's machine gun gentlemen with a sawed-off machine gun cocked over his arm. I wondered what would happen if two or three of those in the audience would try to exercise their freedom of speech in disagreeing with the orator that day.

But in our economy, and in our political system, these powers are not concentrated. They are diffused. Economic powers are diffused among thousands of business men such as yourselves throughout the entire United States. They are diffused in the powers of trade unions, and don't forget, they are strong powers. They are diffused among people who are in our own government, with the powers which they exercise, and they are diffused among 165-odd millions of American people who are really the dictators of the marketplace.

It is this diffusion of power, which is part of our economic and political system, that gives us not only this high standard of living, but also these freedoms.

Many things have contributed to the success of this economy, such things as a country of great natural resources, people with a high degree of initiative, people who are willing to take risks and do enterprises, the inventiveness of the American people. As a matter of fact, one of the most interesting things going on in the world today is how Russia is trying to convince most of the rest of the world that Russians invented the things which the rest of the world knows that we invented. As you go around and talk with people throughout the world, they are more amused at that Russian trick of trying to re-

write the world's history than anything else.

Many things have contributed to the success of American competitive economy, but may I mention two which I think we all too often overlook.

One of these things which has counted for so much of this success is a growing amount of cooperation between government and business within the framework of a competitive economy. If you just read the papers, you get the impression that all we do is fight each other. Poppy-cock! Gradually, throughout the years, we have developed an economy based upon private property, private initiative and a profit motive, within which there is a vast amount of government and business cooperation. Sometimes it is business cooperating with government, as it has to in certain areas where, for the benefit of everyone, we have decided that a certain amount of regulation is necessary, such as banking and insurance, electric light and power, railroad, telephone and telegraph. In other cases it is government cooperating with business, as it has to and must in all those areas where we really want to maintain a competitive system.

We in this country believe that the competitive system is the most effective regulatory system that anyone ever developed because under it we do not have to worry if one company puts a poor product on the market. We know if they do, somebody else down the street will put out a better product and force them to improve their product or get it off the market. And under a really competitive market, we don't have to worry if someone overprices product; the same thing will happen to that individual. But sometimes competition disappears. Sometimes it disappears through too many mergers, through too much price-fixing, and American history is full of such instances. When competition disappears we then expect the government to step in.

We expect the government to step in and, through the enforcement of our anti-trust laws, to be very sure that competition is restored because, if it is not restored, there is only one alternative which the American public will accept, and that is the alternative which we don't want. That is a growing amount of regulation. So we have this cooperation between government and business to help us maintain the very competitive system which is the basis of our great economic wealth in this country.

I think there is another example of cooperation, an example which is perhaps even more important than these other two, and that is the growing cooperation to produce a stable economic system in this country. We know from bitter experience what happens when you go into a great period of deflation. We lived through one a few years ago and we watched from 10,000,000 to 15,000,000 people unemployed. We never knew exactly how many, and we don't want it to come back.

We, likewise, have lived through a period of some 20 years now in which we have watched inflation rob the American people; in which we have seen an increase in the price level of 100 per cent wipe out billions of dollars of savings of people, whether they had it as money in the bank, as life insurance policies, or annuities.

So we have gradually been developing these last few years a cooperative program to stabilize the overall economy through the control and expansion of credit, overall monetary and fiscal controls, through control of the tax rate—decreasing it as we did a couple of years ago when business started to slow up, increasing credit costs as in

recent months when business has been running too fast and there are signs of inflation again.

One of the problems we face is to get out of all the detailed regulations that we have already built up in our farm program. In general, we know that broad overall controls are in harmony with a competitive system, but when you get down to detailed regulations of controlling what you are going to produce and the size of your crop, and so on, you are into a detailed regulation which most Americans, at least, do not like. And what a mess we have got ourselves into! I haven't looked up the figures this morning but it is something roughly around \$7,000,000,000 that we have tied up in a farm price support program.

I was out not very many weeks ago to see several large circus tents which had been put up to help hold a wheat crop. I went into some shipyards and looked at some moth ball government-owned ships with wheat and cotton in them. I discovered it is costing the American taxpayer something in the neighborhood of \$700,000 a day just to store these commodities. However, what I'm saying now has nothing to do with the political situation, with which I am not concerned, at least at the moment.

Yet there are those who would still urge that the only answer to this is to abandon flexibility and go back to higher price supports, the only result of which, of course, would be increased crops and increased quantities to store. If we really want to solve this problem, we must face the fundamental fact that we are currently producing more of these things than the American public and the world markets will absorb at prices which are profitable to the American farmer. Therefore, if we want to solve the problem in the long run, we have to do it through a gradual process of taking people off farms. What we should be doing, it seems to me, is working out a program of helping those people to make the transition, rather than trying to work out a program that will leave them for the inevitable low standard of living.

Under any kind of crop price supports, as long as we keep producing, don't we need some kind of a program which will prevent a drastic fall in prices? Maybe the answer would be to guarantee that no price will be allowed to fall more than 10 per cent in a particular year, but still letting it go down if that is essential to help move people from one type of career into another.

There is one other point that I think we all too often fail to appreciate, and it has contributed to the success of the competitive economy of ours. This is the evolution in the philosophy of you people here today. It is the evolution in the philosophy of the American businessman and the American business woman.

If you would go back with me in the history of the United States up until 100 years ago, you would find that the philosophy of the typical business leader of 1850 could be expressed in this trilogy: the longest possible hours, the lowest conceivable wages and the highest unit of profit per product put on the market.

We were that sure of this philosophy 100 years ago. We knew that was the way to run a business. Today all you have to do is state that philosophy to realize that we have abandoned it. Today we know it is high wages increased by productivity which create markets in which people can sell goods and it isn't long hours, it is shorter hours with increased automation which give people leisure time in which to buy and use goods. It isn't the

height of the profit margin that is important, but a smaller profit margin spread over millions of units, that will not only increase the standards of living, but, in most industries, also increase the take home pay of those who have their dollars invested in it.

I don't have to urge the members of your industry to take a smaller profit margin. I have here something about your profit margin, and may I say that I am ashamed of you! It says that for a 30-year average you have earned 1 per cent on sales and roughly 6 per cent on net worth, and last year you felt so charitable that you earned 4/10 of 1 per cent on your sales and less than 4 per cent on your net worth. You ought to be ashamed of yourselves. You are in an industry in which you need millions of dollars in the years just ahead to modernize your plant and equipment and to engage in research, which is so important in terms of improving methods to market your present products and also so important in developing the new products that you need to bring out. You also need to be more fair to your stockholders than you have been.

No American business man has any right to be in business if he can't treat his stockholders fairly. Forgive me for being so rough, but I think it is important. I am not an expert in your field, but I do know something about the field of marketing because I spent most of my life in it. I would throw out this suggestion, as some of you already are discovering, that at least one of the things more of you have to do is to develop some way of being sure that your brand name stays on the package, in the size in which it is finally bought by the housewife. I don't know whether you are going to do it through frozen packages or pre-cut fresh meat, or some kind of non-refrigerated package, but you are going to do more of the cutting in your own place of business with a greater control over that product as it goes through the channels of distribution and finally gets into the retail store.

What am I saying to you this morning? Really three very simple things. I am saying that this competitive economy of ours is far from perfect. There are lots of things we have to do in it. There are still people without enough income. We still have more than 2,000,000 people unemployed in this country despite our great prosperity. We still have a third of our people without any kind of voluntary health insurance. In no sense can we be complacent, but compared with other economies throughout the world, past or present, we are without peer.

We have a competitive economy which is producing a rising standard of living shared by a greater part of the total American citizenry, and it is the only kind of economy which guarantees and underwrites the full freedom of men. Finally, as we contemplate the significance and the success of our economy, the growing amount of cooperation between government and business within a free private enterprise system, and the gradual evolution and the philosophy of American businessmen and women, I say to you without any fear of being wrong, that we face a future in which we can count on still a higher standard of living within a country which can remain dedicated to the freedom of mankind.

Pictures of the new "lean trim" pork products, as displayed at the convention, will be found on page 153.

PREDICTION

Rare Opportunity For Business Seen



C. BRODERICK

• At least 90 per cent of the snares and pitfalls which lie in the path of American business are products of the vivid imaginations of economic researchers and should be banished into exterior darkness. Of the remaining 10 per cent, the most constant threat to American economic stability is the so-called inventory recession.

We Americans do everything on a big scale. When our manufacturers and distributors really get the bit in their teeth and wildly overestimate the demand for their products, the carriage they are pulling is likely to wind up against the nearest tree. On the two and only two occasions when our national economy declined during the postwar period, 1948-49 and 1953-54, abnormally high inventory-sales ratios were at the root of the trouble. In fact, the 1948-49 decline was the classic example of a "pure" inventory setback, since general business activity dropped \$13,000,000,000 and all of it represented inventory reduction on the part of businessmen.

Under the circumstances, it is not surprising that the fashion of the day is to forecast a third postwar inventory setback, to begin about six months from now. This prophecy has not been developed out of thin air, and we can't dismiss it too cavalierly. It is built upon the admitted fact that inventories were accumulating at roughly \$4,000,000,000 annually in the second quarter of this year and \$3,000,000,000 annually in the third. On the expectation that this process of building up stocks will continue for six months more, a large and growing body of economists strongly contends that American business will topple over the precipice into another inventory recession in the second quarter of 1956.

However, before we decide to give up the ghost and to accept the slings and arrows of outrageous fortune, let us try a few other facts on for size. In the first place, the current wave of inventory accumulation began barely eight or nine months ago and was preceded by 15 long months of liquidation, during which businessmen frantically rid their shelves of refrigerators, radios and other durable goods.

Secondly, consumption is considerably higher now than it was prior to the 1953-54 business relapse, and inventory-sales ratios correspondingly lower. Thirdly, the prospect of rising prices is the Lorelei which lures manufacturers and distributors into extending their for-

ward commitments for raw materials. The *only* good aspect of President Eisenhower's illness I can think of is the possibility it may shake businessmen's confidence in the price structure a little and make them a little less avaricious to accumulate stocks.

Lastly, and it would be difficult to overstate this simple truth, our economy has a natural tendency to grow and usually will do so if we just leave it alone. Our economy doesn't require a steady diet of hypodermics to keep it healthy and will surely outlive the economic doctors who think it does.

All this is by way of saying that the traditional way in which our economy strays from the path of virtue, to wit, the inventory recession, is no threat at all in the immediate future. As for the inventory decline scheduled by so many economists for second quarter, 1956, it is indeed possible, but it is not probable.

Were we to rest content with this appraisal of American business prospects, we would bring the wrath of the economic fraternity down on our heads. According to many astute observers of the economic scene, a number of soft spots other than the inventory situation have developed in our business structure, notably a skittish stock market, a vulnerable foreign trade position, extreme stringency of credit, excessive consumer debt and declining farm income. Let us try to put each of these problems in its true perspective.

First, the neurotic stock market. There is no phase of the American economy that provides so many occasions for quoting the epigram, "Fools rush in where angels fear to tread," as does the stock market. I am going to try not to be a fool by not trying to predict the near-term behavior of security prices.

What does concern us here is the claim that, should the stock market take a bath in the months ahead, it would make the entire economy vulnerable to collapse. The possibility that the market may swoon sometime within the forecast period, either on general principles or because of some specific event, was demonstrated rather forcibly by President Eisenhower's sudden illness. However, it's a long step from this admission to the conclusion that the national economy is equally susceptible to a fainting spell.

At the risk of losing my Wall Street friends and alienating people, I'd like to take some potshots at the cherished Wall Street belief that the stock market is a reliable harbinger of business trends. According to this belief, the Dow-Jones industrial average is a sort of impersonal deity to be spoken of with bated breath. It supplants Providence in the business affairs of men, foresees the future with uncanny accuracy and possesses mystical powers one may revere but cannot hope to comprehend.

In the light of the assertion that "The Market" sees all and knows all, it is remarkable that it makes so many errors. In fact, a cool appraisal of its record from 1929 to 1939 seems to indicate that stock prices never did anything but reflect corporate earnings statements of the day before. From 1939 to date, when the industrial averages were asserting their independence of the current trend of net corporate profits and were practicing the art of forecasting, they seem almost invariably to have been wrong.

For example, it would be difficult if not impossible to find an economic indicator more out of tune with the facts of the business world than the stock market was

from 1946 to 1949. When the national economy buoyantly rode out the inventory recession of 1949, the stock market painfully gave birth to the idea that this post-war economy of ours is far less vulnerable to prolonged depressions than the economy of 1929. By 1955 that idea had finally grown to manhood, but it is pretty difficult to have much faith in the omniscience of the stock market when it took ten long years fully to realize what was fairly obvious back in 1945.

This is another way of saying that, if business activity and the stock market are not actually divorced, they are at least occupying separate bedrooms. In my opinion, it is the beginning of economic wisdom not to predict business prosperity on a rising stock market or a business recession on a falling one.

Another alleged weakness in today's economy is our vulnerability in the field of foreign trade. With England making frantic efforts to get off the ropes by increasing her exports to us, and with Japanese textiles already flooding the American market, it is feared that our merchandise export balance will be eliminated and that American-made goods will go begging for a buyer in competition with the products of cheap foreign labor.

Far be it from me to derogate the adverse effects of a possible deterioration of our position in international markets on export houses or on individual companies and industries. The time-honored definition has it that a recession is in progress when you lose your job and a depression when I lose mine. In line with this definition, businessmen directly affected by foreign competition are understandably frightened by the ogre of vanishing markets.

The problem of foreign competition, however, is a specific one; it hardly touches the American economy as a whole. Our gross exports barely amount to 1/25th of American business activity and our net exports to only 1 per cent or so. Unless one is dedicated to the proposition that the scallops around its circumference are what make the pie, this country is singularly insulated against business conditions in the outside world.

One of the more recent examples of losing one's sense of proportion was the dire warning of certain economists in late 1949 that the American commodity price structure would collapse if England were to devalue the pound. This prophecy fell somewhat short of fulfillment, and it was stupid ever to have made it.

A third source of concern to people who like to wring their hands over the sorry plight of the American economy is the current tightness of credit. Hardly an economist in the country but raises the question of whether the business bubble may not be burst by the restrictive credit policies of the Federal Reserve Board and the attendant rise in interest rates. Here I'm going to convict myself of heresy and put myself beyond the pale of respectable economic forecasting by questioning both the fact and the theory of money tightness.

What do we find on reviewing the actual record of credit extension this year? Merely that commercial, industrial and agricultural loans—the so-called business loans—increased contraseasonally from January 1 to June 1. On June 1 they took off into the stratosphere and now are breaking through the sound barrier.

According to good classical economic doctrine, rising interest rates should discourage businessmen from bor-

rowing and particularly from borrowing long-term money. Unfortunately, as most of us find out before shuffling off this mortal coil, what should be and what is are two different things. Cruel experience says that, generally speaking, businessmen don't borrow money on the basis of what interest rates are but on the basis of what the prospective borrower thinks they will be. Human beings are prone to extend indefinitely any existing trend. Most businessmen are perfectly sure that interest rates will rise tomorrow if they're rising today. That's why they virtually broke down the doors of lending agencies in the second quarter of 1953, when interest rates were higher than they had been in a dozen years. And that's why, even if the long-term interest rate structure were to rise further in the months ahead, no disaster would befall corporate capital expenditures.

What's more to the point, the monetary authorities are likely to tread very gingerly in the direction of tightening credit, now that President Eisenhower, the symbol of business confidence, has been stricken. In my opinion, long-term interest rates are more likely to be stable than to rise or fall appreciably in the near future.

Now to whip a dead horse on this subject of the adequacy of our financial mechanism to support the current business boom, let me say a word about becoming obsessed with the magic properties of the so-called money supply. To judge by some of the pronouncements on this subject, all that's necessary for controlling the economy is to turn the money supply on and off like a spigot. We ought to live in constant trepidation, therefore, that someone may forget to turn on the water at a time like the present when lots of water is necessary to keep the economic pot boiling.

What has common sense to say of this theory? The facts seem to assert that the money supply is large or small because the economy is large or small, not the other way 'round. To be more specific, full employment, high wage rates and so forth produce a large supply of money; they are not produced by it. For now and forevermore, let the money supply fret about the economy, not the economy about the money supply.

Another and even more common cause of mental indigestion, for those who expect the worst on the economic front, likewise concerns the field of money and credit. We've been concerned thus far with the contention that not enough business credit will be available to keep the economy on an even keel; now let us examine the claim that too much consumer credit has already been extended, particularly in the installment field, a claim that proves we economists are capable of worrying on both sides of the street at the same time.

On the surface, this last position has a lot to back it up. Where installment debt averaged about 7 per cent of disposable income just prior to World War II, it is higher than 10 per cent today and rapidly getting higher. There is plenty of food for thought in these statistics. Unquestionably, installment debt cannot continually mount, vis-a-vis the wherewithal to pay it off, without grave danger for the economy. Unquestionably, the consuming public cannot borrow without limit against future earnings without eventually coming a cropper.

What I would dispute is that we are already skating on thin ice in the matter of installment debt. A bare comparison of the ratios between debt and income ob-

taining in 1940 and today, without reference to the different patterns of life in these two periods, can be seriously misleading. Some small part of today's repayments on automobile paper used to go out in the form of rapid transit and railroad fares.

Today's installment payments on refrigerators, in greater or lesser degree, supplant the 25¢ a day we used to pay the iceman. Of course, no one was contractually obligated to buy a cake of ice prior to World War II, but it was a good idea to do so if you expected to eat something besides shredded wheat. Finally, we are living in a virtually "servantless" society today, and the installment charges on our vacuum cleaners, washing machines and other household appliances are the counterpart of the wages formerly paid to butlers, cooks and French maids. In short, it is natural and reasonable that installment debt in our new postwar society should loom larger against the background of disposable income than it did prior to the war, though the sky is not the limit and though there is some indeterminate point beyond which installment debt cannot safely mount.

There is no doubt that the economic status of the farmer has worsened considerably during the past four years. Equally, there is no doubt that the farm problem calls for the most intelligent political handling, whereas all signs point to its being made a political football in 1956. A welter of ominous forecasts that the farm depression will put the over-all economy into a tailspin already has started the ball rolling.

The role of the farmer in our economy is a vital one, and his interests should be properly safeguarded by government. How this is to be done is a subject for another time and another place. What I would like to comment upon today is the loose talk, which does not serve the farmer's true interests, to the effect that the farm depression of 1926 paved the way for the business disaster of 1929.

Here is how the farm depression of 1926 led to the general debacle of 1929: in 1927 gross farm income was higher than in 1926, in 1928 higher than in 1927, and in 1929 higher than in 1928. It cannot be said exactly that these statistics strongly support the notion that the 1929 collapse started "down on the farm."

Before closing the books on the business outlook, a word on the recent decline in commodity prices may be in order. In spite of the business boom of the last twelve months, the daily index of wholesale commodity prices is somewhat lower today than it was a year ago, and substantially lower if industrial raw materials are excluded from the lineup. For example, hog prices displayed extraordinary weakness this year. Does this softness in commodity prices other than those for industrial raw materials portend a decline in retail prices in general and a setback for the over-all economy?

Now it must be admitted that falling commodity prices are a bete noire of many economic prophets. More often than not, we are told, debility of the commodity price structure has been the forerunner of a general business relapse. Fortunately, there are one or two gaps in the reasoning behind this theory.

In the first place, the current decline in the daily index of wholesale commodity prices has been going on for more than four years. Aside from the general imprac-

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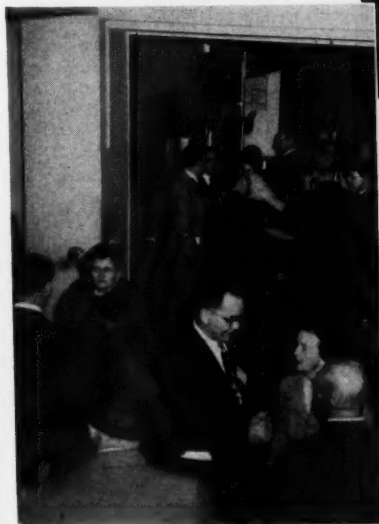
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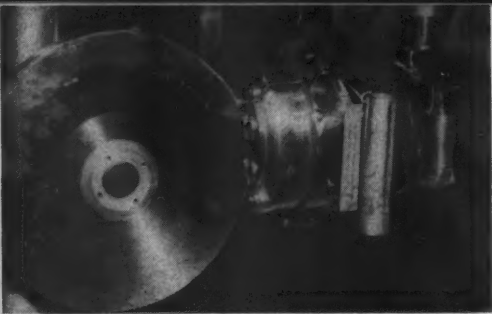
ONER



In the Exhibit Hall



EQUIPMENT R



1

1. HEAVY DUTY BREAKUP SAW is designed for breaking beef or pork carcasses. The saw can cut meats up to 4½ in. in thickness and can be used for rail breaking of beef quarters. A 2-hp electric motor powers the 12 in. blade. Control is by a trigger switch located in the pistol grip handle. Side handle permits positive guidance, either in block or rail breakdown of carcass meats. The motor is splash proof. The saw guard and saw can be removed quickly for servicing the saw blade. Best & Donovan, Chicago.



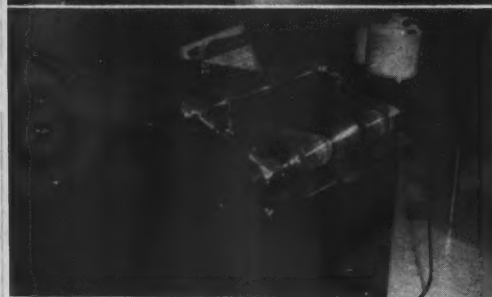
2

2. NEW MACHINE can form up to 1,200 hamburger patties per hour in standard patty sizes. As patty is formed and dropped on roller conveyor, it passes sheet interleaver and then moves on to the stacker which accumulates the pieces to desired count before dropping the stack onto belt which carries it to the packaging station. The patty-forming die can be changed for different hamburger shapes. Use of roll paper for interleaving reduces paper costs. All parts of the machine in contact with the meat are made of stainless steel. The machine is stuffer fed. Package Enterprises Inc., San Francisco.



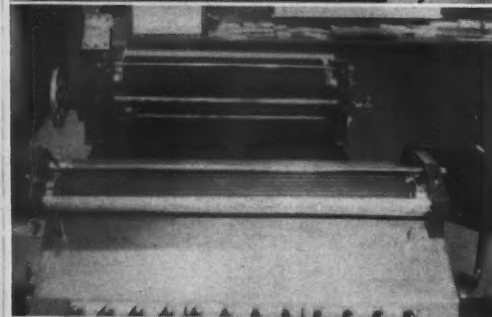
3

3. REDESIGNED CONVERTER can comminute frozen meats with no pregrinding. Controls have interlocking features for safety. Large face dial gives readings on product temperature. Knives are held in place by micro-collars and positioned by micro-screw adjustment. Mounted for easy tilting with a large loop type handle, the unloader quickly empties the emulsified meat into the sausage truck. Engineered in terms of component sub-assemblies, all parts of the converter are replaceable with standard parts. John E. Smith's Sons Co., Buffalo, N.Y.



4

4. NEW MACHINE separates heavy bellies into two portions, one of which is suitable for bacon production. Belly width can be adjusted to include the meaty section on the cut intended for bacon. The machine also reduces the thickness of the belly to a desired standard. Two-way pull-through action by a pressurized rod conveyor belt brings the belly against the thickness knife and then the width knife. Size adjustments are made quickly. The knives can be removed for honing or sharpening. Machine can keep pace with mechanized cutting operations. Townsend Engineering Co., Des Moines, Iowa.



5

5. TWO CASING CLEANING machines can handle up to 500 sets of either sheep or hog casing per hour. Machines feature a low water consumption as a ½-in. perforated pipe on each machine supplies water under low pressure. Roller components are bearing mounted and can be removed by loosening accessible holding nuts. Polishing machine has soft rubber type rollers which minimize damage to tender sheep casings. Stripper features safe feeding as intake has protective guard. With a suitable transfer belt, a single motor can power both units. Strings are freed from casings, preventing knotting. Units take minimum floor space and one operator can work both. Koch Supplies, Kansas City, Mo.



6

6. A NEW KNIFE and knife locking method, faster knife shaft and bowl speeds, and increased horsepower in the electric motor make it possible for this unit to comminute frozen meats with no pregrinding. Unit features low bucket rest to minimize the lifting required to load the bowl. The motor is fully protected, enclosed and ventilated. Bowl has rim guard to prevent damage to bowl from loaded sausage trucks. Drive bearings have complete moisture protection. Where required, the machine is equipped with pressure grease fittings. Over-the-side unloader quickly empties the bowl. The Cincinnati Butchers' Supply Co., Cincinnati.

T REVIEW . . .

7

The latest in meat industry equipment taken directly from exhibits at AML convention. Photographs by The National Provisioner.

7. A TAKE-OFF mounted on the fan belt wheel of the truck motor transfers power for a truck refrigeration system through a newly-developed flexible shaft. Thermostatic controls cut in the flexible shaft which operates the compressor only as required. Compressor, shown at right, is part of evaporator unit and is mounted in truck body. While operating the compressor, the flexible shaft simultaneously drives a generator which supplies the current required to operate blower units on evaporator and condenser. The condenser is mounted under truck body. Kold-Hold Div., Tranter Mfg., Inc., Lansing, Mich.

8. HIGH SPEED STACKING is possible with new machine which produces up to 1,200 slices of sausage meat per minute. The machine can group in counts of 4, 5, 6, 8, 10 and 12 slices. The stacks are collected on vanes which, on the completion of the correct count, deposit the stacks on a conveyor belt. Proper processing will assure slicing and stacking to the correct weight approximately 85 per cent of the time. The machine features positive hydraulic action, ease of cleaning and stainless steel for meat contact areas. The Allbright-Nell Co., Chicago.

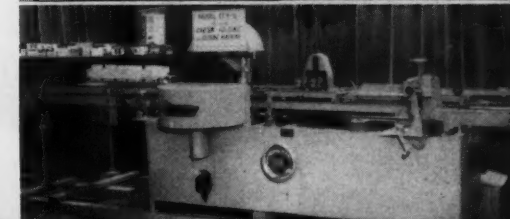
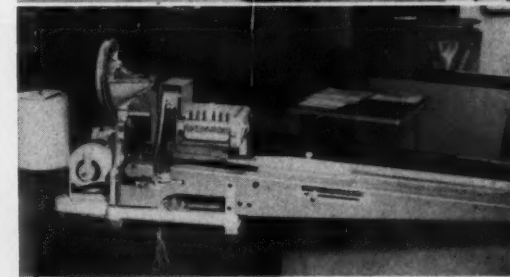
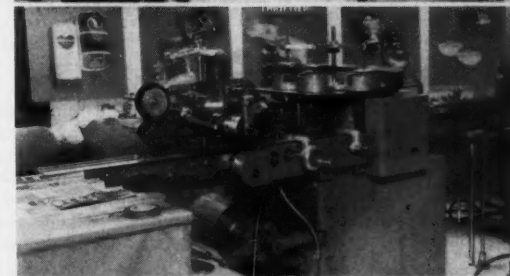
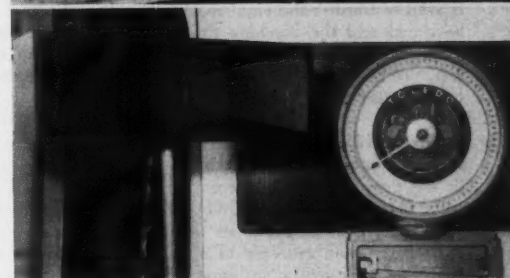
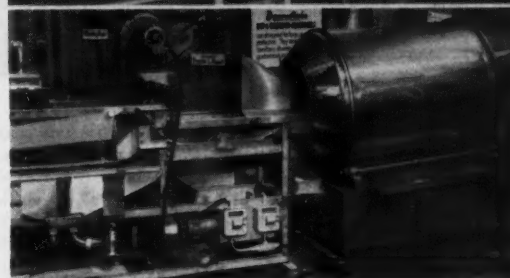
9. HIGH SPEED BREADING line is shown here. The first section of the machine sprays the oncoming cuts with batter. The meat passes through a batter dip and then on to the breading tumbler. The machine can control the exact amount of batter or breading pickup. The unit has gentle breading action, holding product damage to a minimum. All excess breading is rescreened by the unit for reuse and batter is repumped. Units can be engineered to handle any desired capacity. Units are easy to keep clean. Downyflake Breader Mix Division, Doughnut Corporation of America, New York, N.Y.

10. REMOTE WEIGHING with either floor or rail scales is possible with this newly-developed system. The large face indicator can be mounted at a considerable distance from the actual scale and the scaler can record the weight there. A companion recorder enters weights on tape and makes individual weight tickets. The system removes one element of error in continuous chain weighing tasks. Toledo Scale Co., Toledo, Ohio.

11. OVERWRAPPING up to 80 packages of sliced stacked meats with any of the standard films such as cellophane, Pliofilm, Saran, glassine, etc., can be done with this machine. It can be changed over quickly to handle either square, oval or loaf cuts. The machine is fully automatic — feeding a card under oncoming product, sealing film material over product and card, applying thermoplastic label over folds and code dating finished package. Unit operates on no-package, no-paper principle. Wrap-King Corp., Holyoke, Mass.

12. REDESIGNED UNIT places string tie loop on cellulose casing as it pleats and caps the container. Machine looping permits use of more lower-priced, lighter string. The string loop is held in position by the metal cap. Feed mechanism requires perfect alignment before folding and capping operation commences. Rate of machine is limited by speed of operator. A scale on the side of the machine permits easy alignment of feed guide bar for different casing widths. Micro switch has been placed under cover. Tipper Tie, Inc., Union, N. J.

13. CARTON FOLDING and closing machine is supplementary unit to high-speed carton forming machine. With simple wheel adjustments the unit can handle packages in 1/2, 1, 2, and 4-lb. sizes. Unit will fold and close upward of 120 cartons per minute. Alignment bars on the machine guide oncoming cartons in damage-free flow pattern. All parts of the unit are accessible. Peters Machinery Co., Chicago.



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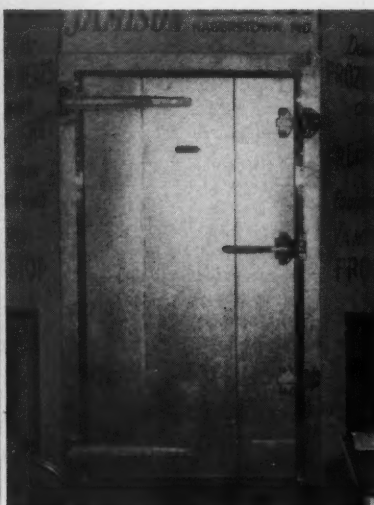
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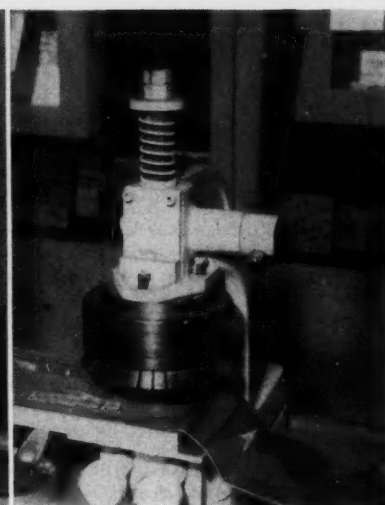
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14. RAPID CUTTING of meat under vacuum with no pre-grinding is a feature of this German unit. The bowl section is locked into position when the knife shaft moves downward into bowl. Vacuum is pulled on the bowl as the cutting operation begins. Product comminuted in this machine will stuff compactly and slice firmer since it contains no air pockets. With the aid of a hoist, the bowl in which the meats are comminuted is used to transfer the emulsion to the stuffer. Cutting cycle can be timed and the machine produces an excellent hamburger. Vertical cutting results in low temperature buildup and fibre-free product. Transporters on bottom of bowl lift meat back onto cutting knives. The Globe Co., Chicago.

15. FREEZER DOORS are kept frost-free, even at temperatures as low as minus 50°F., by thermostatic heaters embedded in the door frame. The doors never are thrown out of alignment because of frost build-up. Life of the gasket and door is prolonged as there is no need to pry doors loose with a crow bar. Doors are easy to open and close and make a perfectly tight closure at all times. Refrigeration is conserved as there is no ice build-up to impede door action. Heating cables are protected with stainless steel cover plates. Jamison Cold Storage Door Co., Hagerstown, Md.

16. MACHINE CRIMPER seals the lids on aluminum pan packages with one easy downward stroke. Machine will close Temp-Tainers, sold by manufacturer, in 6-, 8-, 10- and 12-oz. sizes with no change or adjustment of closer head. The unit is made of cast aluminum and, consequently, is corrosion proof and can be cleaned easily. The unit is portable and can be moved to any station. Sutherland Paper Co., Kalamazoo, Mich.

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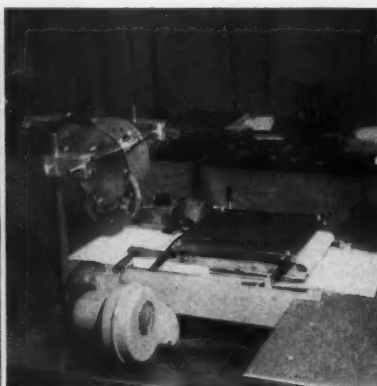


17. DELIVERY OF POWER to the compressor at a constant speed is the function of the new Hydra-Drive mechanical truck refrigeration unit. For maximum refrigeration capacity, the new unit transfers full power to the compressor whether the truck motor is idling or at full throttle. The truck engine drives the new Hydra-Drive pump which, in turn, runs the hydraulic motor located in the refrigeration unit. The unit can be equipped with an auxiliary electric motor for parking. Complete hydraulic-electric units are available in models weighing less than 500 lbs. They have automatic controls and defrosting. U. S. Thermo Control Co., Minneapolis.

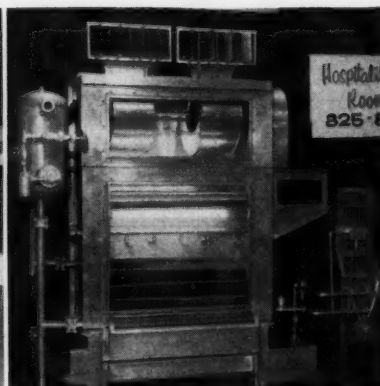
18. NEW PACKAGING CONVEYOR is engineered to give a snug fit to thermoplastic film overwrapped packages. Unit has two blowers at the end of the conveyor which heat the sides of the package after the bottom seal has been made. Heating a film, such as Saran, causes it to shrink to the sliced meats. Another device heat activates the labels used in covering bottom seal. The unit increases packaging productivity by lessening the amount of effort required to make a taut fold around the stacked sliced meats. Great Lakes Stamp & Manufacturing Co., Chicago.

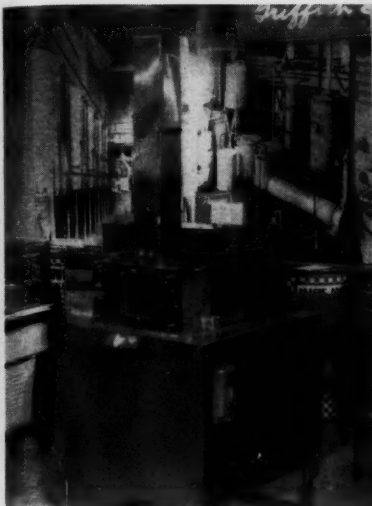
19. REFRIGERATION BLOWER unit features No-Frost performance that reduces the corrosion of cooler rails. The unit is designed for hot hog carcass chill coolers and uses a new solution to keep the evaporator coils free of frost. Solution has no brine and, consequently, there is no entrainment of brine in the air moved in cooler. The unit permits the maintenance of high relative humidity in the cooler, lessening the shrinkage in chilling hog carcasses. The system is fully automatic. The Niagra Blower Co., New York, N.Y.

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20. DESIGNED TO CUT ready-to-heat-and-serve sausage products such as pork sausage, into standard stick sizes, the new unit features smear-proof cutting. The chilled product is removed from a mold and placed in the upright cutter housing. In sequence the following action takes place: criss-crossing knives cut the mold; pusher bars unload the cut sticks, and the next portion of the mold moves into position for cutting. Unit is made of stainless steel. The Griffith Laboratories, Inc., Chicago.



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21. EUTECTIC BLOWER UNITS simplify the installation of eutectic plates in truck body. Bolted to the front frame of the truck body, the whole unit containing the plates can be removed when the truck body is replaced. The unit has a blower on top of the eutectic cabinet which pulls air from the bottom and discharges it from the top, assuring positive air circulation in truck body. Thermostatic control provides positive regulation of temperatures in truck body. The unit's drip pan confines moisture area. Dole Refrigeration Co., Chicago.

22. HIGH SPEED CHUB production, in weight ranges from 4 to 16 oz. in a continuous flow, is possible with a new machine which pumps sausage meat to a tube formed by electronic heat sealing from rolls of thermoplastic film. The unit forms, fills and seals upward of 1,800 units per hour. Simple adjustments permit accurate weight control. Closure is made with a metal clip from wire roll. Kartridge-Pak Machine Co., Chicago.

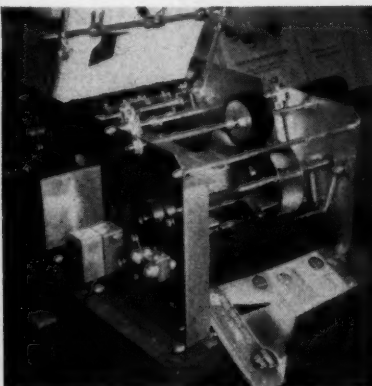
23. CODING MACHINE makes a positive code impression on knock-down wax board packages. Machine can imprint up to 100 units per minute. Equipped with a counter and fed by suction cup action from a large capacity holder, the coder re-

quires a minimum of attention during the printing cycle. Code impression cannot be rubbed off. Kiwi Coders Corp., Chicago.

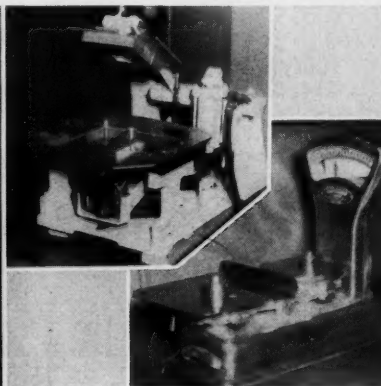
24. COMPLETE PACKAGE ASSEMBLY, from the knock-carton down to the filled and properly check-weighed unit is possible, with this air or manually-operated machine. Unit will form wallet-style packages having overall dimensions up to 8 in. x 8 in. x 2 in. deep. Slug holder in base of unit permits stamping product identity and ingredient information at the same time the package is formed. Air-operated unit has a capacity of 150 assembled packages per hour. Machine operates on 80 to 100 lbs. air pressure and can be furnished with or without check weighing scale. Oster Tool & Die Corp., Chicago, Ill.

25. NEW SCALE designed for packaging of fresh frozen meats eliminates need for calculating the excess or shortage in weight of the package being handled. Weight platter has metal pieces to equal the desired predetermined weight. Placing the package on the large platter gives an immediate reading in ounces of the weight above setting and the operator does not have to make any mental calculation. Adjustments always are made with the metal weight pieces, so that the reading is in ounces above the pound weight. The scale is made of stainless steel and its operation does not require beam adjustment. Exact Weight Scale Co., Columbus, Ohio.

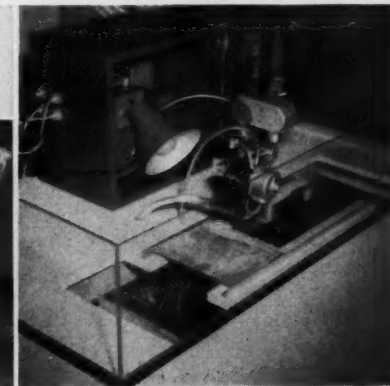
26. ELECTRONICALLY-CONTROLLED unit sprays ascorbic solutions over the surface of sliced meats. Spray is incorporated into the conveyor carrying the sliced meats to the wrapping station. The unit keeps pace with any current machine. Spraying with ascorbic solution improves color of sliced meats and lengthens shelf life. Morton Salt Co., Chicago.



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FIFTY-YEAR VETERANS

Service of the industry's 50-year veterans was lauded by H. Harold Meyer, president, The H. H. Meyer Packing Co., as he presented AMI gold service awards at the traditional annual meeting ceremony during the November 15 general session.

THESE honored guests on the platform should have exceptional meaning to us. Most of these gentlemen began their 50 years of service with the meat industry the year the organization meeting was held for creation of our present American Meat Institute.

Now they are 50-year veterans, just up the road a few months from the American Meat Institute. In the last 12 months, 62 veterans of the meat packing industry became eligible for the Institute gold emblem award. Of these 62 vets, 28 are still working, or have been recently retired, from the same company with which they started; this means 45 per cent of these veterans have worked for only one company. Twenty-two of the vets are on the platform, and, of these, nine have worked

for only one company. That, indeed, is loyalty.

Great changes have taken place since these men first crossed the threshold of a packing plant. Today, when we honor them, both we and they can hold heads high. Service with meat today means service for the public good, service for better human health, service for happier grandparents, service for healthier babies, and service for higher standards of living in the United States.

You gentlemen with me on the platform have been builders of good in your 50 years. The gold emblems we are about to present you are symbols of your long service to a better America.

Brief sketches of the industry background of each of the 50-year veterans begin on adjoining page.



E. BUNCE



M. HALBHERR



R. HITTSON



W. SWEENEY



S. KRISKO



F. TURNER



F. KROPP



G. WEBER



W. OLIVER



E. SCHMUTDE



J. DIETRICH



F. HERTZOG



F. TOBIN



H. PETERS



C. WILBUR



G. JACKSON



P. RONGISH



A. BIGA



J. BARDASH



J. MIKALAUSKI



H. SCHAEFFER



H. SLATERY



W. BRAUN



W. PAYNE



C. FREY



W. FOELL



L. MILES



G. MARKUS

CARL FREY, Wilson & Co., Oklahoma City: His first job was with Morris & Co. in East St. Louis when he was a boy of 13. He worked for Morris in St. Joseph, Mo.; Kansas City, Chicago and Oklahoma City. In 1921, Frey joined Wilson & Co. at Oklahoma City. His experience has been varied, and he has worked in many departments. He is particularly adept with a skinning knife and is a calf skinner at the Oklahoma City plant.

GROVER JACKSON, Wilson & Co., Albert Lea, Minn.: He started with Jacob Dold Packing Co., Wichita, Kan., and then in succession worked for Cudahy at Wichita, Morris at Oklahoma City and Omaha; Hormel at Austin, and finally Wilson & Co. at Albert Lea and Nebraska City. Some of the old-timers around Nebraska City will remember Grover

Jackson as a ball player who should have made the majors, but he made the decision to stick to his trade of hog butcher.

FRANK E. DICKENS, Wilson & Co., Kansas City: In 1886, the first unit was erected of what was to become the Kansas City plant of Wilson & Co. in 1916. It was here that Dickens began his career as a cooler door boy at the age of 12. During the next 13 years he held many jobs of increasing importance. He continued with the firm of Wilson & Co. in 1916 as assistant foreman of the sausage manufacturing department. He has served as sausage foreman at Memphis and as branch superintendent at Jacksonville, Fla. From 1926 until 1934 Dickens was sausage foreman at Kansas City, and from 1934 to 1939 he was division superintendent. At present he is yardmaster at

the Wilson Kansas City plant.

FREDERICK M. TOBIN, Tobin Packing Co., Rochester, N. Y.: He started his meat packing career January 1, 1906, as a car route salesman for Jacob Dold Packing Co., Buffalo. In a couple of years he was promoted to branch manager at Utica. In 1916, Tobin went with C. A. Durr Packing Co., Utica, as vice president in charge of sales. In 1921 Tobin bought controlling interest in the Rochester Packing & Cold Storage Co. In 1924 he built Albany Packing Co., Albany, N. Y.; in 1937, Estherville Packing Co., Estherville, Iowa; in 1934, Tobin Packing Co., Fort Dodge, Iowa. In 1942 these three plants were consolidated into Tobin Packing Co., Inc., with headquarters at Rochester, N. Y. Tobin disposed of the Fort Dodge plant to Hormel in 1953 and the Estherville



W. NEILSEN

F. DICKENS

J. ROE

J. MOKOSAK

H. WELLS

J. GILLS

S. MAGDA



J. WHITESSELL

H. STENBERG

A. DISCHINGER

J. HAMNER

W. GREAR

H. RIHA

W. CONN



J. McARDLE

C. VOGT

T. LIBRANT

C. PERRY

D. NICHOLSON

J. GEYER

J. COKER



H. SOKOLIK

W. CHILDS

C. FARMER

J. LIPP

A. LUNDELL

W. LOWE

G. MARTIN

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CHICAGO 18, ILLINOIS

plant to Morrell in 1954. He is president of the firm that bears his name.

WILLIAM PAYNE, Swift & Company, South St. Joseph, Mo.; He has the distinction of having worked for only one packinghouse department and one company since he began work in the lamb dressing department as a 15-year-old youngster.

HERBERT C. STENBERG, Irwin Brothers, Chicago: He started work in the general offices of Swift & Company in 1905 as a messenger boy. For the next 12 years he worked as a clerk in the invoice department, shipping department and beef order department. Stenberg served with the Armed Forces for two years during World War I and was assigned to special work in the secretary's office when mustered out of service. He worked as a receiving and shipping clerk at the Roseland Market and as a driver at Omaha-Libby Wholesale Market, Chicago. For the last dozen years, Stenberg has been assistant shipping clerk at Irwin Brothers.

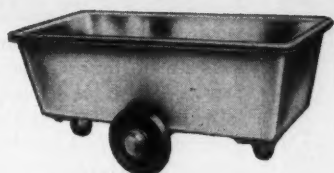
JAMES E. ROE, Swift & Company, Kansas City: Roe started his packinghouse career with Morris, National Stockyards, East St. Louis, as a doorman. He soon was promoted to trimming pork feet, for which the pay was 12 1/2¢ an hour. Then, for a couple of years, he worked for Armour, and in 1907 transferred his interests to Swift & Company at the National Stockyards, working in the storeroom and car shops. Since then he has worked for Swift at Kansas City, Andalusia, Ala., and Chicago general offices and completed his tenure of service at Kansas City.

HENRY J. RIHA, Swift & Company, South St. Joseph, Mo.: Riha started with Swift in 1905 as a messenger at South Omaha. Seven years later he was made a foreman in sausage manufacturing. Seven more years later, he was transferred to Chicago and made superintendent of the sausage department. In 1923 he transferred to the standards department, and in 1929 he was made head of the department. In 1933, Riha was sent to South St. Joseph, where he was made division superintendent, and in 1942 he was promoted to assistant superintendent. Has a son with Swift in Detroit.

WILLIAM M. NEILSEN, The John E. Staren Co., Los Angeles: He started with The Cudahy Packing

STANcase

STAINLESS STEEL EQUIPMENT



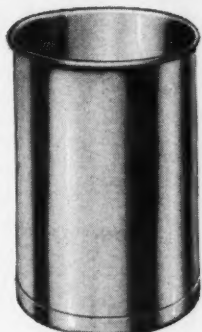
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STANcase STAINLESS STEEL MEAT TRUCKS have been carefully engineered to meet the requirements of modern plants for long-life equipment which can be maintained sparklingly clean and sanitary with minimum labor. There are five STANcase Trucks with capacities of: 225 lbs., 500 lbs., 800 lbs., and 1,200 lbs. Each model has been sturdily constructed of heavy gauge Stainless Steel. Specifications for all component parts are of highest quality standards.

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FULLY APPROVED BY HEALTH AUTHORITIES

Sanitary STAINLESS STEEL DRUMS

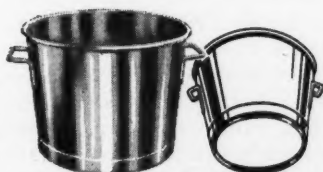
Ruggedly constructed for long-life service of 16 ga. Stainless Steel. Inside surfaces are seamless. Top rims are rolled over heavy reinforcing rods; foot rings are made of extra heavy Stainless Steel; both are closed all around, leaving no crevice where dirt or grime might accumulate. Available in three sizes.



Model No. 30—30 gal. cap.
Model No. 55—55 gal. cap.
Model No. 60—60 gal. cap.
COVERS AVAILABLE FOR
No. 30 and No. 55

All-Seamless STAINLESS STEEL TUB No. 98

(Covers available)



Ideal, sanitary equipment, seamless-drawn out of one sheet of 18 ga. Stainless Steel. The Stainless Steel foot ring and top rim are rolled over heavy, steel reinforcing rods and closed all around, leaving no crevice where grime might accumulate. Handles are Stainless Steel. Foot ring takes abuse of service; bottom of tub does not rest on floor.

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NOVEMBER 26, 1955

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Co. as a messenger for \$4 a week. He worked through such jobs as the mail desk, bill desk and timekeeper. In 1918 he was assistant superintendent at the Sioux City (Iowa) plant of Cudahy. Four years later he was transferred to the Omaha plant with the same title. For the next 29 years Neilsen served as branch manager at Kansas City, Des Moines, New Orleans, Washington, D. C., Philadelphia and New Haven. Neilsen also has been general manager of the North Salt Lake (Utah) plant as well as of the company's Denver plant. A year ago Neilsen retired from The Cudahy Packing Co. and went to work for John E. Staren Co., canned food broker.

WILLIAM GREAR, John Morrell & Co., Ottumwa, Iowa: In April, 1904, Grear was hired in the kill and cut department of John Morrell & Co. at Ottumwa and, with the exception of a short period of time spent in the ice department, he has worked in the kill and cut department during his entire period of employment at Morrell.

HARRY C. WELLS, William Underwood Co., Watertown, Mass.: Wells began work with the Underwood company as office boy in 1902 and was promoted to the sales department four years later. In 1917 the company sent him to Chicago to open a branch. The next year he returned to Boston and continued in the sales department. For 30 years Wells was the sole sales representative of the company and was acquainted with food brokers throughout the United States. In 1950 the company appointed him as sales manager. When Wells left the canned meat company, he had spent 53 years of his business life with the New England firm that has made the little red Devil emblem famous.

L. F. MILES, Peyton Packing Co., El Paso, Tex.: Miles began his meat packing career with Armour and Company in Chicago as a telegraph operator. In 1908, after four years with Armour, he transferred to Morris at East St. Louis and remained there for 12 years, winding up as sales manager for that area. From 1920 to 1927 Miles was sales manager for Louisville Provision Co., Louisville, and then went to Peyton Packing Co. as sales manager. In 27 years with Peyton he has become a vice president and president and now

is one of three partners owning the packing company. Miles is currently a member of the AMI board of directors.

HARRY SCHAEFFER, The H. H. Meyer Packing Co., Cincinnati: Here is another packinghouse worker who started with The H. H. Meyer Co., and this year, 50 years later, completes his lifetime business career. He has been in the traffic department practically all of the time.

WILLIAM E. OLIVER, Afra division, Meat Industry Suppliers, Inc. Chicago: As a boy of 15, Oliver started with Swift & Company in the sausage department at the South St. Paul plant. Eight years later he was transferred to the company's Winnipeg (Canada) plant, where he remained until 1919, becoming superintendent in charge of smoking and curing operations. When Oliver left Canada, he went to work with Morris & Co., Chicago, in charge of curing operations. In 1921 he was transferred to the company's plant in Oklahoma City in charge of pork operations. In 1926 Oliver switched over to the Barney Brennan Packing Co., Chicago, to become superintendent. In 1929 he went over to C. A. Durr Packing Co., Utica, N. Y., and in 1941 was promoted to general manager of the company. He later left to take over the responsibilities of vice president of The Afra Co., a subsidiary of Meat Industry Suppliers, Inc., with general offices in Chicago.

CHARLES VOGT, Oscar Mayer & Co., Philadelphia: He started in the meat packing industry in 1905 with F. G. Vogt & Son, Philadelphia. From 1910 to 1912 he was employed by Cuero Poultry Co., Cuero, Texas, and then for the next 35 years he was employed by the Vogt company as production superintendent. In 1947 Vogt went with the Hygrade firm in Philadelphia for a year, but returned to the Vogt company in 1948 and has been there ever since as a special projects man, remaining in this capacity when Oscar Mayer & Co. purchased the company.

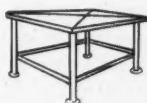
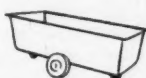
ALBERT DISCHINGER, Oscar Mayer & Co., Chicago: Dischinger started work with the Morris company in 1903, and for the next 30 years he worked as a beef cutter, calf buyer, salesman and all-round worker. He joined Oscar Mayer & Co. in 1939 and has remained with

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the Chicago headquarters of that company ever since as a butcher in the beef department.

JAMES ASHLEY GILLS, Kingan & Co. Inc., Division of Hygrade Food Products Corp.: Here is another worker who has spent his entire 50 years of service in the meat packing industry with one company. Gills began as a mail boy, and his industry responsibilities since have varied: storeroom clerk, invoice clerk, account clerk, timekeeper and bookkeeper. He now is cashier of the Richmond city branch, Richmond, Va.

CHARLES ROBERT HILDEBRANDT, The Hildebrandt Provision Co., Cleveland: In 1883, an 18-year-old German-speaking lad, fresh from Danzig, browsed through the market section of Cleveland looking for work. A German policeman steered him to a farmer, and for a year young Hildebrandt tended the flocks and pitched the hay. However, he yearned for city activity, and his first meat job was with Ohio Provision Co. A short time later he went over to Armbruster Meat Co. of Cleveland. Here he met another German, August Habermann. They hit it off well in the plant and out of the plant, both marrying sisters. After a few years, Hildebrandt and his brother-in-law bought out the company. In 1893 he started his own sausage plant. The plant is still there, having undergone many expansions, and Charles Robert Hildebrandt, too, is still there. Now 90 years old, Hildebrandt goes to his office every day.

GEORGE MARKUS, General Meat Co., St. Louis: Markus got his start as a 12-year-old lad in the town slaughterhouse in Temesvar,

Hungary, where he was an apprentice butcher. In 1911 he came to the United States and started with Independent Packing Co. as a sausage stuffer. He later worked at Krey Packing Co. for four years and for four years with Louis Forrest Packing Co. as cattle butcher helper. For two years Markus was a full-fledged cattle butcher with Gruensfelder Packing Co. From 1930 to 1953 he worked for Monarch Packing Co. as top cattle butcher. Markus has been employed by General Meat Co. since 1953.

H. H. SLATERY, East Tennessee Provision Co., Knoxville, Tenn.: Another man who has devoted his half century of service in the meat packing industry to just one company, Slatery joined East Tennessee Packing Co. in 1905 as a bookkeeper. Two years later, he was elected to the company's board of directors. As the company expanded its operations Slatery devoted more of his time to the field of credit and accounting. In 1917 he was promoted to the position of assistant secretary-treasurer, and a year following to secretary-treasurer. He held this post until 1954, when he was elected treasurer of the company. Slatery is recognized as an outstanding authority on credit in the meat packing industry.

ADAM BIGA, The Cudahy Packing Co., Omaha: Biga entered the employ of The Cudahy Packing Co. at Omaha in December, 1904. His service has been continuous with Cudahy since that date. During the greater part of that period, Biga has been employed in the beef slaughtering department.

WALTER BRAUN, The Braun Brothers Packing Co., Troy, Ohio:

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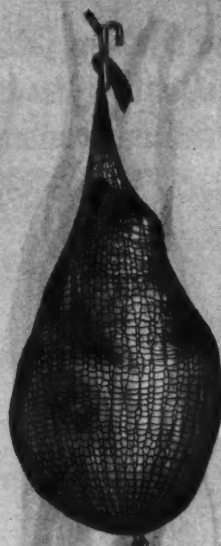
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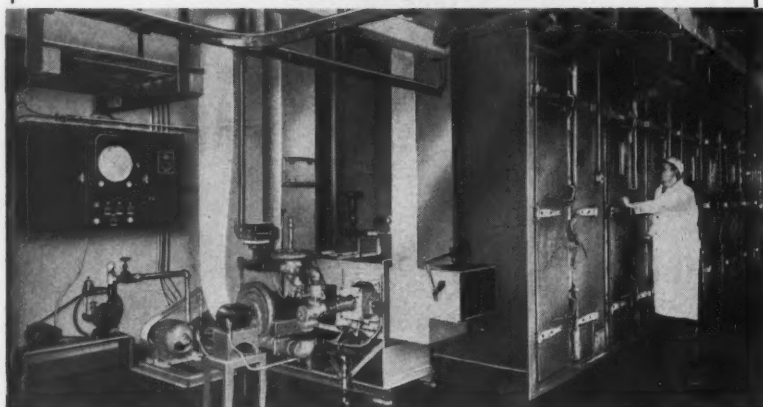
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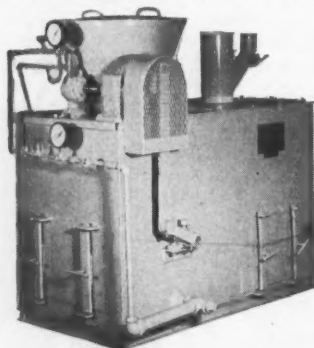
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Braun started working when he was 15 years old in the butcher shop and slaughterhouse owned by his father. During World War I, he served with the artillery in France. After being mustered out following the Armistice, Braun returned to his family's business, and soon plans for expanding the company unfolded. In 1927 all the retail business of the company was disposed of, and activity was concentrated on the wholesale end. Many physical additions to the company's original buildings were being made, and several of these in spite of the depression period. After the close of World War II, the company found it necessary to find more space for its meat packing operations. A new packing plant was decided on and was completed in 1951. Since 1952, Braun has relaxed somewhat from his previous strenuous business activity and spends more time on his 200-acre farm.

SEYMOUR MAGDA, P. Burns & Co., Ltd., Calgary, Canada: As a boy of 14, Magda first caught on in the industry with his own father in the latter's butcher shop, which he opened soon after coming to the states from Rumania. In another year, young Magda switched his butchering skill to Armour and Company, where he worked on the killing floor in the livestock and hide departments. When the company was sold to P. Burns Co., Magda continued his work. In his long years of service in the industry, Magda has spent most of it on the killing floors, being equally skillful in calf, beef and hog killing.

DR. A. O. LUNDELL, The Allbright-Nell Co., Chicago: Dr. Lundell's first take-home pay came from the United States government in 1905 as a result of being a veterinary inspector, Bureau of Animal Industry, USDA, on assignment to South Omaha, Neb. Five years later he was assigned to Oklahoma City as inspector-in-charge. In 1914, Dr. Lundell was transferred to Fort Worth, Tex., as inspector-in-charge and in 1917 to St. Joseph, Mo., with the same title. In 1919, Dr. Lundell resigned from government service to take a position with The Allbright-Nell Co. in Chicago. In 1934 he was appointed sales manager, and 20 years later he became a vice president of the company.

JOHN MOKOSAK, E. W. Kneip,

THE NATIONAL PROVISIONER

Inc., Chicago: Unlike many of the other 50-year veteran meat packing workers, Mokosak has spent his entire half-century of industry work in Chicago. He started with Morris in 1905 and 13 years later went to Lincoln Wholesale. In 1925 he joined National Packing Co., in 1929 he went to Armour and in 1933, to P. J. Harte & Co. The next year he went to work for H. Graver & Co. He didn't stay long with Graver but shifted to Guggenheim. He switched back to Armour in 1941 and in 1946 found himself with E. W. Kneip, Inc., where he still is. Mokosak's work with the Kneip company is as a calf skinner.

J. T. HAMNER, San Antonio, Texas: He started work with Morris & Co. in Memphis, Tenn., in 1905 in the bookkeeping department, transferred four years later to Helena, Ark., as branch house manager, and then went to Little Rock as branch house manager until 1912. He then shifted to S. & S. in Hot Springs, Ark., as branch house manager, then went to Houston, Tex., Fort Smith, Ark., and finally back to Morris & Company in 1913 at Savannah as a beef man. He served as branch house manager for Morris at Augusta, Ga. Hamner left Morris in 1917 to organize his own business, which he has continued up to the present time in San Antonio.

WILLIAM S. CONN, Edward Kohn Co., Chicago: He got his start in the industry in 1900 at the Armour branch house in Des Moines as office boy. Four years later he transferred his skill to National Packing Co. in Philadelphia, and in 1909 he went to work for Roberts & Oake, Inc. From 1912 to 1925 Conn sold meat for George A. Hormel & Co. He then returned to Roberts & Oake and remained with this company until 1940. Later he worked for Miller & Hart, but joined the Edward Kohn Company in 1953.

GEORGE MORRIS WEBER, Stark, Wetzel & Co., Indianapolis: He joined the Charles Oeftering Meat Market in Indianapolis in 1903 as a butcher's helper and remained there until 1917, leaving to work for the government's secret service division during World War I. In 1919 he joined Meier Packing Co., as a salesman, and three years later he set up a business of his own, Weber Beef Co., in Indianapolis. In

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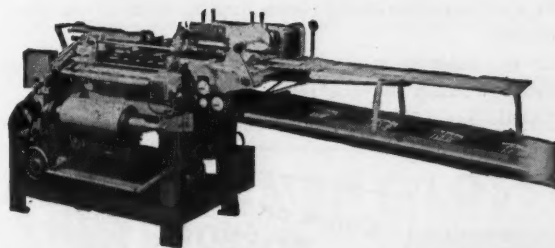
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1932 he joined Riverview Packing Co. as sales manager and later worked for a short time with Kuhner Packing Co. In 1937 Weber joined the Stark, Wetzel organization in the sales department. He has been four times a member of the "Two Million Pound Club" and a member of the "One Million Pound Club" each year except one. In 1950 the company designated Weber as "Salesman of the Year."

JACOB BARDASH, Stark, Wetzel & Co., Indianapolis: Bardash came to America from Rumania in 1905 and started work with the Indianapolis Abattoir in the slaughtering department. In 1908 he transferred to the oleo department and later shifted to lard refining and the inedible department. During World War I, Bardash was deferred, working in the vital oleo oil division of the Indianapolis Abattoir. He remained with this company until 1941, when the firm was sold to Stark, Wetzel. He was retained to set up the new company's inedible department, where he has been foreman.

HENRY PETERS, Stark, Wetzel & Co., Indianapolis: Peters got his industry start in 1905, when he began work as a butcher's helper with his father's butchering firm. Four years later he left Indianapolis and went with Rosenberg Butchers, Brookville, Ind., as a butcher. Five years later Peters returned to Indianapolis and the Ernest Wurster Co. During World War I, he was in the Army as a mess sergeant, but he returned to Wurster's in 1918. During 1931, Peters was a butcher for Standard-Kroger and Dandy Markets in Indianapolis. For six years he was with Hashman's Meat Co., and in 1942 he joined Stark & Wetzel. He is now foreman of the bone-in cuts of the company's beef department.

WILLIAM J. FOELL, Foell Packing Co., Chicago: "Bill" Foell, as he is known through the meat canning industry, started his industry career 60 years ago, when his father gave him a job in the business which was started in 1868. He opened his own plant in 1905 at 22nd st. and Archer ave., Chicago, with two employees, who helped him pack dried beef in 5-lb. cartons which were sold to retail markets. When he opened for business, dried beef was selling for 8c a pound, and horse cars were

driven west only as far as the Foell plant. Foell moved in 1924 to the present location on West 47th st., where the company puts out 35 different items. In 1915 Foell Packing Co., won an award at the San Francisco Exposition for its thin-blown tumbler as a meat container.

MATTHEW HALBHERR, Fred E. Lins, Inc., Milwaukee: Halbherr got his start in 1903 with Gross Packing Co., of Milwaukee. There he worked on the killing floor and later transferred to the sausage kitchen. After three years with Gross, Halbherr switched his industry skill to the Lins company and worked at various phases of the sausage industry, later becoming production manager. He has been with the Lins company 49 years and is a vice president of the company.

THOMAS LIBRANT, Armour and Company, Chicago: Here is another worker who has spent his entire lifetime of industry service with one company. He started in 1905 in the hog tank department and has been working there for 50 years.

EDWARD SCHMUDDE, Armour and Company, Chicago: Schmudde got his start with Libby and after a year and a half transferred to Swift. For the last 47 years he has worked in the millwright department of Armour and Company.

JOHN DIETRICH, Armour and Company, Chicago: He got started in the meat industry in 1905, and for the last 40 years he has been employed in the cooperage shop of the Chicago plant.

CHARLES D. WILBUR, Armour and Company, Chicago: Starting as an errand boy in the Chicago office of Armour and Company in 1906, Wilbur later held sales positions in Galesburg, Ill.; Louisville, Ky.; Jacksonville, Fla., and Pittsburgh, Pa. He has been associated with dairy and poultry products sales since 1922 and was named to his present position of manager of frozen egg sales in 1944.

FRANK J. KROPP, Armour and Company, Chicago: In 1904 a strong lad got a job in the Armour plant as a door boy. For 11 hours daily he opened and closed doors, receiving 10c an hour. He finally got a chance in the sheep dressing department at 15c an hour. His next job with the company was as a calf

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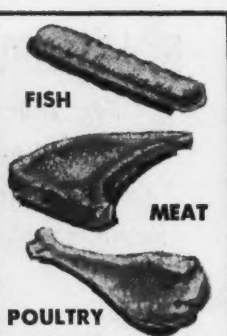
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skinner at 4c per head. From 1915 to 1922, Kropp raised livestock in Colorado. He returned to Armour as a sheep butcher. When he retired a short time ago, he was considered an all-around butcher who had performed practically every task on the floor.

JOHN MIKALAUSKI, Armour and Company, National Stockyards, East St. Louis, Ill.: Mikalauski was born in Lithuania and came to this country in 1903. He started working for Armour in 1905 in the cattle dressing department and has worked there ever since. He is a cattle splitter and until a few years ago used a hand cleaver; then a change was made to power saws.

DAN NICHOLSON, Armour and Company, Chicago: Nicholson's half century of meat packing experience began as a general office messenger in 1904 at \$4 weekly. Next he was a laborer in the sausage room; checker on the loading dock and specialty department foreman and later had jobs in the butterine and lard refinery departments and North American Provision Co. Nicholson was promoted to foreman in the box factory in 1945 and held that position until he retired a few months ago.

JAMES T. McARDLE, Memphis Packing Co., Memphis, Tenn.: In 1904, McArdle got a job as office boy in the tin shop of the Kansas City plant of Armour and Company. Later he switched to the general office and went on through various operating departments, including laboratory, accounting and sales. He was made division superintendent in Kansas City in 1925, transferred in 1927 to the Oklahoma City plant as assistant superintendent and in 1932 to Memphis Packing Co. as superintendent. McArdle has a brother who is casualty representative at the Kansas City plant, and a nephew, Thomas Kennally, is a trainee livestock buyer at Memphis.

FRANK C. HERTZOG, Jacob E. Decker & Sons, Mason City, Iowa: Hertzog started work in his father's slaughtering shop in 1905 in Knoxville, Iowa, and worked there three years. In 1908 he hired out as a meat cutter to Wolcott & Sons, Monroe, Iowa. Later he was to become manager of a market owned by George Vindersgle of Monroe. In 1911 Hertzog was hired by The Cudahy

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Packing Co., Omaha, as a salesman. He spent a few years with Ogden Packing Co., Cheyenne, Wyo., then with Morris & Co., Omaha. He was retained when Armour and Company absorbed Morris and worked as division sales manager in Omaha, Pittsburgh and Chicago until 1937. He then was transferred to the newly-acquired plant of Jacob E. Decker & Sons of Mason City, Iowa, where he still is employed as sales supervisor and specialty canned meats salesman.

JOHN W. WHITESELL, Armour and Company, South St. Joseph, Mo.: This man started working for Morris in 1905 when he was 17 years old. He became an Armour employe in 1923, when the merger occurred. His first job was as a fireman. Later he transferred to the hide cellar, where he has worked continuously and at present is a hide inspector. Mrs. Whitesell also is an Armour employe and has worked for this company for 33 years. At present she is in the hog casing department in South St. Joseph.

ERNEST BUNCE, Armour and Company, Kansas City: Bunce, for the past 30 years an employe of Armour and Company's pipe shop, reached the half century mark in the meat industry a few months ago.

JAMES COKER, Armour and Company, Kansas City: Coker began with Armour in 1905 as a helper on Sugar Lake during the ice harvest. His job was to saw ice into proper size, after which it was placed in buildings near the lake. The ice was used during the summer period for cooling purposes. Since 1911 Coker has been employed in the lard refinery department of the Kansas City plant.

JOE LIPP, Armour and Company, Kansas City: Lipp got his start with Armour as a door boy in Kansas City and has spent half a century of meat packing experience in various departments of that company.

WILLIAM LOWE, Armour and Company, Kansas City: An enviable record of service has been turned in by William Lowe of the machine shop, who has completed 50 years of service with Armour. For his first job with the company, he was assigned to cleaning condenser pans in the No. 4 engine room in 1904.

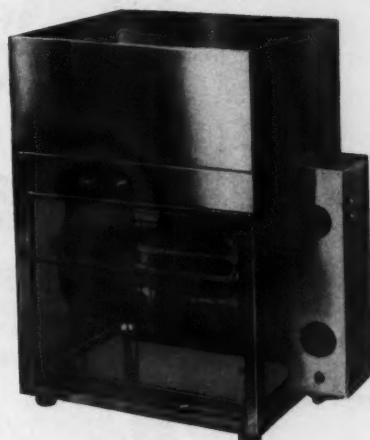
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and Company, Kansas City: Turner began working for Armour in 1904, trimming beef hearts. He has been working continuously in the beef selected meats department since that time.

WILLIAM D. SWEENEY, Armour and Company, Omaha: He began in 1904 in the Omaha plant of Armour and Company. After a short period, he transferred to Swift in the same city, transferring later to the company's Denver plant. In 1912 he switched to Colorado Packing & Produce Co. in Denver and remained there until 1915. He returned to Armour soon afterward and has been working at the Omaha plant since 1925.

PAUL RONGISH, Armour and Company, Nebraska City, Neb.: Here is the case of a veteran meat packing worker who got a job first and went to school afterwards. When he was 10 years old, Rongish went to work for Morton Packing Co. in Nebraska City. After three years of work, he decided to go back to school for a couple of years. In 1910, he returned to Morton. He has been working for Armour and Company since 1921.

GEORGE MARTIN, Pittsburgh Provision Company, Pittsburgh Pa.: This man has a safety driving record to be proud of. He has driven a trailer truck to various branch houses of Armour and Company in Pennsylvania, Ohio, and West Virginia 475,000 miles without an accident. Hired in 1905, Martin remembers when he made deliveries of meat products in the Pittsburgh area with a horse and wagon in the early days of his career.

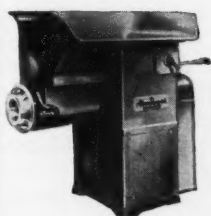
JOHN SMISEK, Armour and Company, Omaha: He started with the company as a messenger in 1904, then was a test clerk and clerk in the accounting department for the next 13 years. In 1917 Smisek was transferred to the hog purchasing department, and for nearly 40 years he continued in that department, being one of the chief hog buyers when he retired.

WALTER CHILDS, Armour and Company, Chicago: His first job in the industry was with Armour and Company, Kansas City, in 1904. He remained with that company for 15 years. In 1919 he went over to Morris and continued with Armour when the merger took place. He has been

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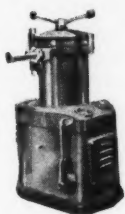
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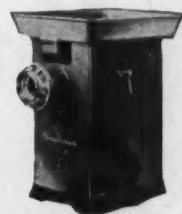
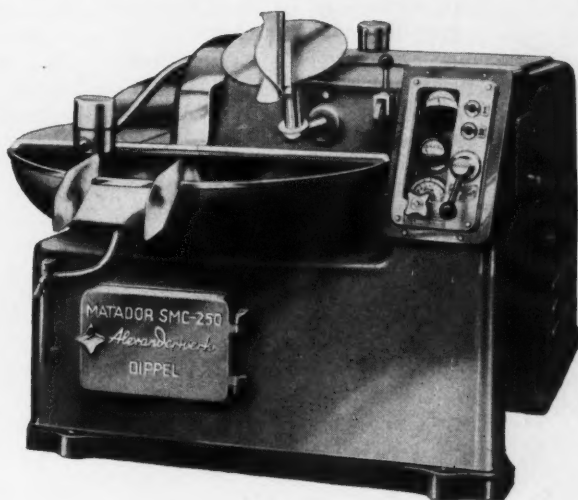
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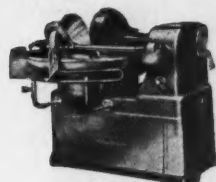
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employed continuously on the beef killing floor as a butcher throughout his career.

CHARLES PERRY, Armour and Company, Chicago: He started with Armour in 1904, and for several years he worked at learning a number of the skilled jobs on the beef killing floor. Several years later, Perry was sent by the company to various of its other plants to help out. He has had the job of skinning cattle for many years. Perry has two sons working in the same department.

CHARLES FARMER, Armour and Company, Chicago: Farmer worked for his father in the latter's retail butcher shop from 1894 to 1901. He spent a short time in California but not in the meat industry. In 1908, Farmer started with Armour in dry sausage casings and has worked almost all his time in this department.

STEPHEN KRISKO, Pittsburgh Provision Co., Pittsburgh, Pa.: Krisko started his meat industry experience in Austria, where he was born. He worked in the meat packing industry there until 1906, when he came to the United States. He caught on immediately with Pittsburgh Provision Co. and served in the beef slaughtering department until 1934. He then transferred to the police department as a box puller and continued in that work until his retirement a short time ago.

ROLLA HITTSON, Jackson Packing Co., Jackson, Miss.: Hittson started with Swift & Company, Fort Worth, in 1904, working in the curing cellars and sausage department. During World War I, he entered the armed services, and, when mustered out, went to work for Longino & Collins, New Orleans, as sausage foreman. In 1927, he went with Beasley Packing Co., Jackson, Miss., as curing and sausage foreman. In 1933 Hittson became associated with Austin Packing Co., Houma, La., and then jumped around some. He went with Jackson Packing Co., in 1935; Owen Brothers, Meridian, in 1945, and Beasley Packing Co., Hattiesburg, Miss., in 1947. Hittson returned to Jackson Packing Co., in 1952 as superintendent of manufacturing, which is the position he retains today.

EDWARD DOUGHERTY, Morrell-Felin Co., Philadelphia: Dough-

erty started with John J. Felin & Co., Inc., in 1901 as truck driver and has been on the job ever since. The firm name recently was changed to Morrell-Felin Co., after the company was acquired by John Morrell & Co. of Ottumwa, Iowa.

HARRY SOKOLIK, Royal Packing Co., St. Louis: He started work in a meat market in St. Louis in 1905, and in 1907 he became a partner in the firm of Dunne Brothers, slaughterer and retail market. In 1913 Sokolik, with Harry Kaiser, started his own plant, and in 1917 he bought out Belesot Packing Plant, taking in Oscar Weil. In 1920 Sokolik leased the plant of Wackman Packing Co., and he bought it outright in 1922. In 1928 he bought the adjoining packing plant, then operated by his former partner, Harry Kaiser. In 1940 the name of the company was changed to Royal Packing Co.

ELMER G. HAUG, Oswald & Hess, Inc., Pittsburgh, Pa.: Haug has worked for his present company for the past 35 years. Prior to this employment, he worked for local and western packers operating in the Pittsburgh area for approximately 15 years.

GEORGE J. MERZ, Oswald & Hess, Inc., Pittsburgh: Merz is employed as a sausage stuffer and has been with Oswald & Hess for the past 13 years. Previous to this period, he was employed by local and western meat packers operating in the Pittsburgh area.

SAM HOLECZY, Oswald & Hess, Inc., Pittsburgh: Holeczy has been with the Oswald & Hess company for the past 15 years. Previous to this experience, he was employed by local and western meat companies and served a spell in the retail meat trade. Holeczy learned his trade in Europe before coming to this country.

JOHN GEYER, Pittsburgh Provision Co., Pittsburgh: Here is another chauffeur who has worked continuously for Pittsburgh Provision Co. since 1905. He, like his friend, George Martin, of the same company, remembers the days when he made deliveries with a horse and wagon.

The new Purchasing Guide for the Meat Industry will be published soon by The National Provisioner.

BRODERICK LOOKS AHEAD

[Continued from page 204]

ticability of using an economic indicator that is at least four years too early, it would seem that the national economy should have faltered in 1951 or 1952, when commodity prices fell continuously and sharply, not now when this decline has virtually halted. In the second place, a much more general charge can be levelled at the practice of using commodity price weakness as a bellwether of depression. It's a wonderful idea to have a fire-alarm that rings whenever there's a fire, but the firemen are going to be run ragged if there's a steady stream of false alarms. It may be true that price softness in commodities has fairly commonly preceded depressions, but the number of times is legion when it has rung the gong and there wasn't a fire.

To summarize these views about the short-term business outlook, I believe:

1. That the type of set-back known as an inventory recession is out of the question in the immediate future;

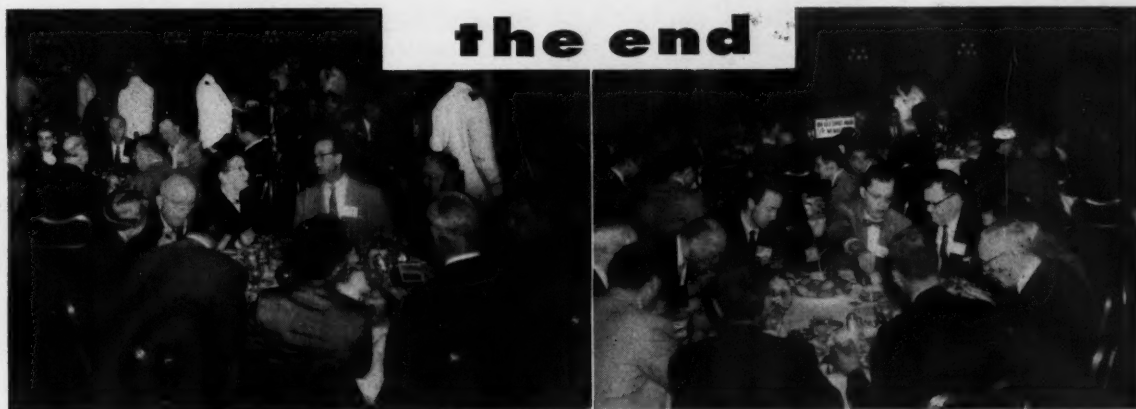
2. That the inventory recession scheduled for second quarter, 1956, is possible but not probable;

3. That stringency of business credit will not bring the business structure tumbling down on our head;

4. That consumer debt is not yet out of line with consumer income, though it could become so in the future;

5. That the prolonged decline in the price level of commodities other than industrial raw materials is not the signal for a general economic bust.

Admittedly, this is an optimistic forecast. My only excuse for making it is this: the Skid Rows of this land of ours are full of people who persisted in betting against the New York Yankees, the Notre Dame football team and the American economy. The economic prospect opening up before us presents at once a challenge and a rare opportunity. To judge by the way in which you members of the American Meat Institute have met the tests which confronted you in the past, you will not fail to measure up to the requirements of the future.



LOOK AHEAD LUNCHEON, AND BUSINESS SESSION WHICH FOLLOWED, ENDED THE FIFTIETH MEETING.

Iowa Community Boosts Pork Sales at Half-Prices

Housewives bought pork at half price last weekend as Vinton, Ia., and a hog raisers' organization opened a community-wide attack on sagging pork and hog prices.

Grocers sold 10 tons of pork in less than two hours at bargain-basement prices. Promoters of the sale promptly raised more money and ordered a second shipment of 11,000 lbs. from meat packers at Waterloo. "And we think we might need more, about 10,000 pounds," a spokesman for the group declared.

The meat sold for an average of 8c below wholesale prices, or about half of the regular retail price.

"We hope the idea catches on and will be picked up around the Midwest," the spokesman said. "If it does, we can make a very helpful dent in the current hog surplus."

Hog prices to farmers are the lowest in Iowa since February, 1942. Farmers have sold 200 to 220 lb. hogs for \$11.50 to \$12, as much as \$9 less than two years ago.

M. P. Kruse, editor and publisher of the *Cedar Valley Times* here, said the "main thing in this program to me is that it shows people will buy and eat pork if the product is sold at low prices.

"I hope we can show we can subsidize this thing ourselves without any government help," Kruse said.

Army to Have Sole Job of Military Food Management

The Army now has sole responsibility for managing the food requirements of the Army, Navy and Air Force in a move designed to eliminate excessive inventories and waste and to reduce cross-hauling of products.

Under terms of a directive signed

by Deputy Defense Secretary Reuben B. Robertson, jr., the Army will take the requirements of the three military departments, determine after examination of inventories how much has to be purchased, warehouse inventories for the services and sell the consuming services what they need from common stocks.

Although the Army Quartermaster Corps long has been charged with responsibility for buying food, orders would have to be placed for new stocks to meet a department's requirements even though adequate stocks owned by another department might be available. The system was severely criticized for waste by the Hoover Commission after a finding that the Navy had a 60-year supply of canned hamburgers and a 36-year supply of bacon on hand.

The military departments annually consume an estimated \$1,000,000,000 in food supplies.

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Farm Experts Urge Test of Food Stamps for Surpluses

An immediate test of a food stamp plan as one means of increasing consumption and reducing farm surpluses was urged this week by the agriculture committee of the National Planning Association.

The committee, made up of 30 farm experts, recommended that the plan be tried out in areas or cities where unemployment is a problem and that studies be made to determine the costs and the amount of increased consumption obtained. Distribution would be handled through regular channels, and stamps would be issued to low income people for the present only for foods in surplus, especially animal products.

The group also recommended vigorous steps to expand the school lunch program to reach at least 75 per cent of school children, instead of the present 30 per cent, and the inclusion of more animal products in the lunches served in the schools.

U.S. to Ease Controls on Certain Exports to Reds

Export controls on private commercial trade in peaceful goods with the European Soviet bloc will be eased under a plan announced recently by Secretary of Commerce Sinclair Weeks. The new procedure is expected to become effective by the end of this year.

An initial list of certain peaceful goods which may be exported under general license, rather than requiring individual licenses as at present, is being established by the Bureau of Foreign Commerce.

Tallow, hides and skins are among commodities recently shipped to the Soviet bloc of countries under individual licenses.

Industry Men to Speak At Methods Conference

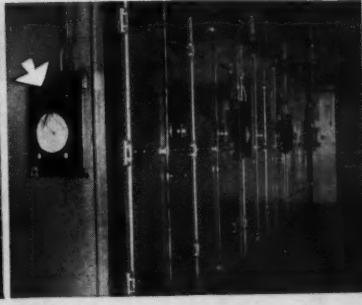
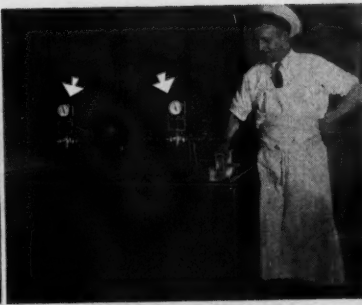
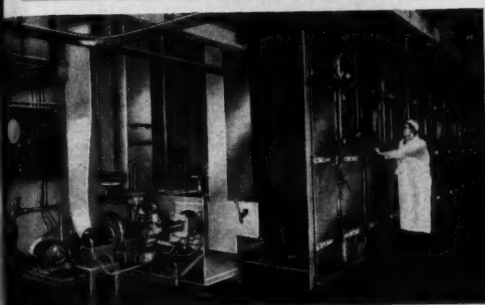
Two packing industry representatives will be among the speakers at the Methods Improvements Conference Thursday and Friday, December 8-9, at the Illinois Institute of Technology, Chicago.

LeRoy Wickstrom, project development engineer, Oscar Mayer & Co., will serve on the panel for a Thursday morning workshop on "Improvements in Human Engineering." W. J. Galle, statistician in the research division of Armour and Company, will be a panel member at a Thursday afternoon workshop on "New Frontiers in Quality Control."

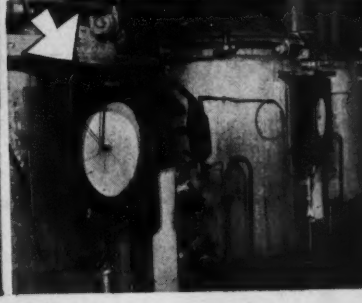
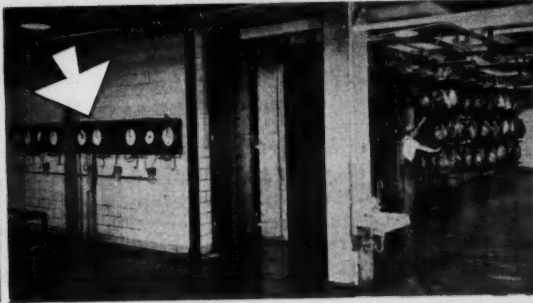
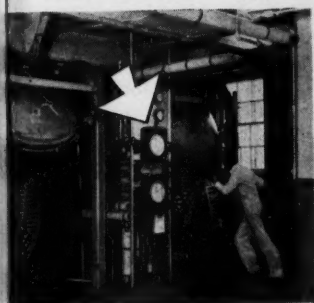
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Source for

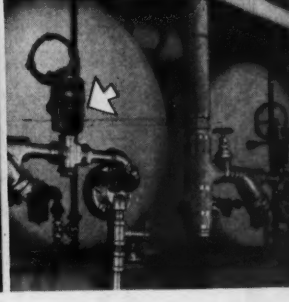
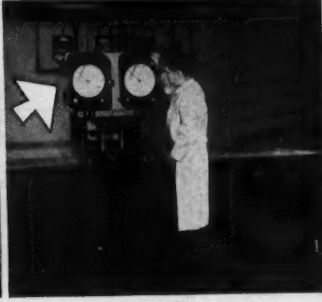
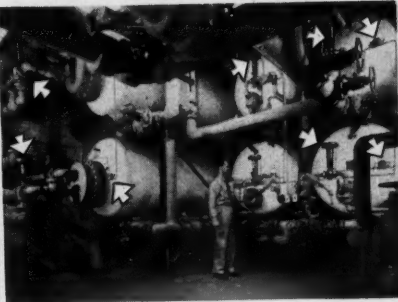
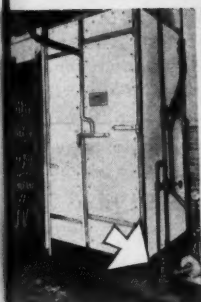
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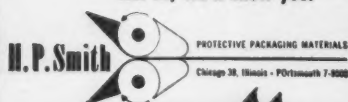


• If Pigs had a choice (which they usually don't) their "going to market" wardrobe would always be the old favorite, HPS Loin Wrap. Most Packers know this.



• That's why pork loins have traveled in first class condition for over half a century, from packer to purveyor. HPS makes many meat wraps for many uses.

Call us, we'll show you.



Packer Says New is Old

The recent announcement in the press to the effect that the pork cuts to be put upon the market by certain packers are to cater to the taste of the ultimate consumer to the extent of carrying only $\frac{1}{4}$ in. of fat covering on pork loins and butts, instead of about twice that amount which they have had heretofore, has interested the management of Cudahy Bros. Co. A statement issued by the firm said:

"We have been aware for years of the aversion of Mr. and Mrs. Public to the fat content of all pork cuts and we have been catering to this taste, adhering to specifications for pork cuts which are being now proposed by our competitors. We have been rewarded for our efforts by the demand for these products at premium prices which the public has been glad to pay for them."

Cattlemen's Convention to Emphasize Beef Promotion

A record cattlemen's convention attendance is seen in mounting reservations for the 59th annual meeting of the American National Cattlemen's Association in New Orleans, January 9-11, with reservations totaling to date more than 1,100, according to a recent announcement by the secretary of the association.

Preliminary program schedules show the cattlemen will give special emphasis to beef promotion, with two of the country's top beef publicity men slated for appearance on the platform. Carl F. Neumann, general manager of the National Live Stock and Meat Board, and Forest Noel, ex-

ecutive director of the newly created National Beef council, will explain the ramifications of beef publicity work. A committee panel on the subject is also scheduled.

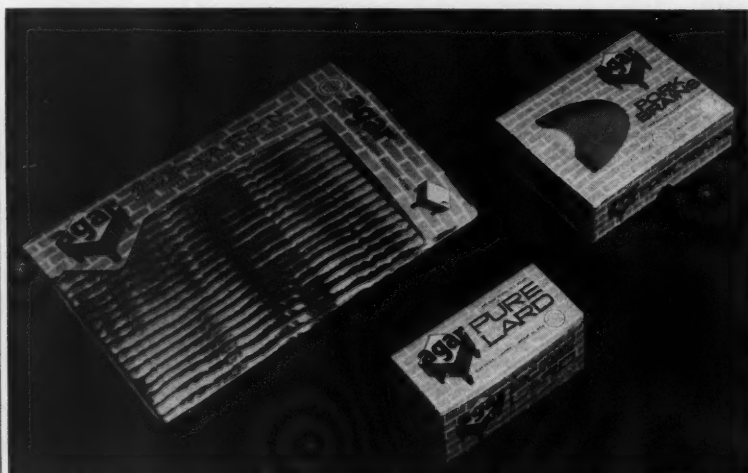
The closely related subject of federal beef grading will be discussed by experts in a panel before a joint session of the association's marketing and feeder committees. A highlight will be a report by Alan Rogers, chairman of the research committee, using slides to show the results of his committee's findings in its work in ferreting out the most troublesome spots in ranch operations.

Sunnyland to Use 'Wild Bill' Label on Some Items

Sunnyland Packing Co., Thomasville, Ga., has become affiliated with the Wild Bill Hickok merchandising division of Delira Corp. and will begin packaging several of its items under the Wild Bill Hickok label, J. L. Roberts, Sunnyland president, announced.

The items to be packaged under this label include cello franks and vacuum pack items. Other items will be earmarked for this special promotion at a later date, Roberts said.

Sunnyland plans to embark on a fully integrated merchandising and promotional campaign for items bearing the Wild Bill Hickok signature, using radio, television and newspapers. By tying in with Delira and Wild Bill Hickok, Roberts explained, Sunnyland is able to provide dealers with specialized help at the point-of-sale, backed by coordinated advertising, merchandising, promotions and publicity.



STANDOUTS in self-service meat cabinets are these new packages of Agar Packing & Provision Corp., Chicago, making use of bright colors and simple family design. Red, yellow and black form the color scheme. Design uses symbolic Agar cutting table, stylized brand name and product identification. Marathon Corp., Menasha, Wis., is the supplier.

Flashes on suppliers

BOXCRAFT COMPANY: E. P. SCHOENTHALER, vice president of Central Wax Paper Co. for the past seven years has formed his own company to manufacture his recently developed and patented reinforced container for loins and smoked meats. He also is entering the brokerage business and will represent the Pacific Foil Co. of San Francisco. Schoenthaler had been previously associated with H. P. Smith Paper Co. as vice president for 12 years.



E. P. SCHOENTHALER

JAMISON COLD STORAGE DOOR CO.: EDWARD A. NIXON has been appointed chief engineer of this Hagerstown, Md., company. He has been associated with Marine Manufacturing & Supply Co., and has also engaged in research and development for the U. S. Navy. He had been employed previously with Newport News Shipbuilding Co.

SUTHERLAND PAPER CO.: Acquisition of Fort Orange Paper Co., Castleton-on-Hudson, N. Y., has been announced by WILLIAM RACE, president of this Kalamazoo, Mich., company. The Fort Orange firm will be operated as a wholly-owned subsidiary by its present management. GAYLORD BEASON is the executive vice president and general manager.

HOERNER BOXES, INC.: Construction on a 80,000 square foot corrugated box plant in Little Rock, Ark., will be completed early in 1956 by this Keokuk, Ia., company. The new building will replace the present sheet plant operation in North Little Rock.

BASIC FOOD MATERIALS, INC.: Appointment of HAROLD MARKMAN as district manager with headquarters in Los Angeles marks the start of an expansion program on the West Coast.

HOWE SCALE CO., INC.: EDMUND L. FITCH has been appointed sales promotion manager for this Rutland, Vt., company. He will be responsible for all sales promotion and advertising activities.

SPECO, INC.: Plans for additions to the Schiller Park, Ill., plant, which will more than double capacity, have been announced by CHARLES W. HESS, president.

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Speco's engineers will help you improve product quality . . . help you get cleaner, cooler cuts . . . cut down temperature rise on ground products . . . recommend special plates for dry and frozen foods.

FIT ANY MAKE OF GRINDER

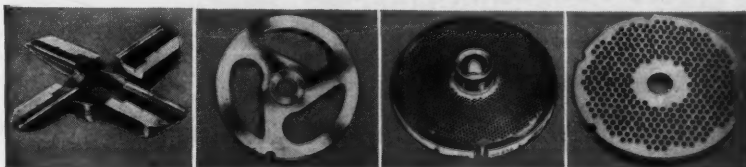
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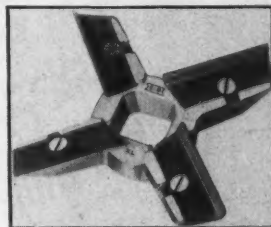
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NEW SPECO PRODUCTS



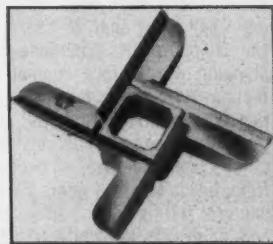
New C-D Bear-Ring

This new retaining bearing insures longer plate and knife life and cleaner cuts because it holds plate and knife in perfect alignment at all times. It also reduces product temperature rise.



C-D X-L Grinder Knife

Features self-sharpening blades that stay razor sharp for the life of the 3/16" cutting edge. 2- and 4-arm styles available. Only for 8 3/4" diameter plates.



C-D No. 7 Grinder Knife

Does an excellent job on pork products. The angle set of the 4 1/4" long blades gives a shear cutting edge. Only for 8 3/4" diameter plates.

ONLY

DAMP-TEX

THE WET SURFACE ENAMEL

CAN MAKE THIS STATEMENT

Steelcote is the pioneer and leader in wet surface maintenance. The Damp-Tex system of treatments and coatings is years ahead. In research, field experience and product improvement, Steelcote pledges to stay ahead. Because of sure satisfaction and longer life, Damp-Tex is the most economical method for sanitizing and beautifying walls and equipment.



Paint experts know why Damp-Tex costs less per painting. They know that 15 years of field development in over 10,000 plants has made Damp-Tex America's outstanding wet surface enamel for economy and satisfaction. Here are some of the many advantages of the Damp-Tex system: (1) skillful analysis of your problem; (2) proper recommendations for surface preparation; (3) one coat coverage; (4) overnight drying; (5) freedom from flavor tainting odor; (6) elimination of rot, rust, bacteria and fungus; (7) an assortment of popular colors and non-yellowing white; (8) freedom from chalking, peeling, sagging, and softening; (9) resistance to alkali and acids; (10) pre-treatment against fungus. For an Analysis of your Paint Problem, Phone or Wire Steelcote.

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YOU CAN...YOU CAN



SURE YOU CAN

IMPROVE THE APPEARANCE & FLAVOR
OF YOUR SAUSAGE WITH AMAZING . . .

PLASMAL

"We're now turning out meats that are plumper, smoother, juicier—thanks to PLASMAL!" This sums up the verdict of more and more makers of fine meat products. PLASMAL does its miraculous work by binding and reactivating the hidden albumen in any grade and kind of meat. Effectively reduces shrinkage and banishes ugly fat pockets. Send for a sample or trial order of PLASMAL—today.

Exclusive Distributor:

SPICENE COMPANY OF AMERICA, INC.

6015 BROADWAY, WEST NEW YORK, N. J.



ALL MEAT . . . output, exports, imports, stocks

Meat Production at New Record High

Meat production under federal inspection for the week ended November 19 rose to 12 per cent to a new record volume of 478,000,000 lbs. on substantial increases in slaughter of cattle and hogs after the previous week's shorter period of operations. Volume that week totaled 426,000,000 lbs. Last week's output was also 13 per cent larger than the 423,000,000 lbs. produced in the same 1954 period. Cattle slaughter rose 9 per cent over that for the holiday period and was 7 per cent larger than a year earlier. Hog slaughter increased 17 per cent to reach 1,715,000 head for the largest weekly kill of the animals in nearly two years. Current hog slaughter was 18 per cent above a year ago. Estimated slaughter and meat production by classes appear below as follows:

Week ended	BEEF		PORK (Excl. lard)		
	Number M's	Production Mil. lbs.	Number M's	Production Mil. lbs.	
Nov. 19, 1955	401	216.5	1,715	231.7	
Nov. 12, 1955	367	197.1	1,470	198.6	
Nov. 20, 1954	374	192.5	1,456	200.9	

Week ended	VEAL		LAMB AND MUTTON		TOTAL MEAT PROD. Mil. lbs.
	Number M's	Production Mil. lbs.	Number M's	Production Mil. lbs.	
Nov. 19, 1955	157	17.6	265	11.9	478
Nov. 12, 1955	161	18.7	250	11.2	426
Nov. 20, 1954	158	18.2	247	11.2	423

1950-55 HIGH WEEK'S KILL: Cattle, 425,695; Hogs, 1,859,215; Calves, 182,240; Sheep and Lambs, 349,561.
1950-55 LOW WEEK'S KILL: Cattle, 154,814; Hogs, 641,000; Calves, 55,241; Sheep and Lambs, 137,677.

AVERAGE WEIGHTS AND YIELD (LBS.)

	CATTLE		HOGS	
	Live	Dressed	Live	Dressed
Nov. 19, 1955	980	537	235	135
Nov. 12, 1955	980	537	235	135
Nov. 20, 1954	958	510	239	138

	CALVES		SHEEP AND LAMBS		LARD PROD. Per cwt. Mil. lbs.
	Live	Dressed	Live	Dressed	
Nov. 19, 1955	210	117	94	45	13.6 54.9
Nov. 12, 1955	210	116	94	45	13.6 47.0
Nov. 20, 1954	219	119	96	46	13.6 52.1

New Zealand Boneless Beef Shipments Reach California

Shipments of about 150,000 lbs. New Zealand boneless cow beef and boneless bull beef were unloaded in San Francisco during the past two weeks, the Western States Meat Packers Ass'n has disclosed.

Previously, it was reported, frozen lamb legs were available in Los Angeles. Also recently, importers have approached retail meat outlets concerning importing from Australia and New Zealand frozen pre-cut lamb in Cryovac bags.

The Bureau of Meat Inspection of the State Department of Agriculture is now making an inspection of these importations due to the fact that the importers failed to report the shipment to the State Department of Agriculture as required under law. "This requires that the Director of Agriculture be notified of such shipment so that, in accordance with this Act, the Director may cause the meat to be inspected upon arrival to establish its fitness for human consumption. It also requires that such meat shall be tagged as foreign cold storage meat, inspected and passed, and

that such tag shall not be removed until the package is broken and that the tagged meat shall be subject to reinspection. The law requires that meat importers be licensed and pay an annual fee of \$25, according to WSMFA.

"The meat was imported by the International Packers, who have a license, but failed to notify the Director of Agriculture, of the shipment," WSMFA said.

United States lamb orders from Australia already this year have totaled 355 tons, according to The Australian Meat Board.

New Low 74.5% Meat Index

The wholesale price index on meat continues to decline, falling in the week ended November 15 to 74.5 from the previous long-time low of 75.6 for the week before, according to the Bureau of Labor Statistics. The lower index on meat also helped cut average primary market prices by 0.1 point to 111.1 on the basis of the 1947-49 average of 100 per cent. Livestock and related products declined an average of 1.8 per cent, with hogs off 6.4 and steers down 2.9 per cent.

First USDA Canned Pork Buy Totals 642,000 Lbs. Product

The U.S. Department of Agriculture reported purchases last week of 642,000 lbs. of canned pork products under the recently-announced pork purchase program. Of this total, 415,800 lbs. were canned luncheon meat and 226,200 lbs., canned pork and gravy.

The USDA will continue to receive on a weekly basis offers to sell the USDA canned pork products; lard on Monday, Tuesday, for canned luncheon meat and canned pork and gravy, and Wednesday for canned ham.

The USDA is broadening weight specifications for canned ham to encourage more offerings. Canned ham weights will be from 6 to 12 lbs. Previously, weights were limited to the 6 to 8 lb. range.

Cuts to be used in the luncheon meat, which will be packed in 6-lb. tins, will include pork shoulders, hams and loins. Cuts to be used in the pork and gravy, which will be packed in 1-lb. 13 oz. tins, will include hams and loins.

Awards last week on luncheon meat were made to three bidders out of a total of eight who offered 1,663,200 lbs.

Details of purchases last week follow:

Firm and f.o.b. point	Quantity	Cents per lb.
Canned Luncheon Meat		
George A. Hormel & Co., Austin, Minn.	59,400 lbs.	39.19
Rath Packing Co., Waterloo, Ia.	237,600 lbs.	39.75
Cudahy Brothers Co., Cudahy, Wis.	118,800 lbs.	41.90
Canned Pork and Gravy		
North American Packing Co., Boston, Mass.	56,550 lbs.	62.50
	56,550 lbs.	63.50
	56,550 lbs.	64.50
Haley's Food, Inc., Hillsboro, Ore.	56,550 lbs.	62.63

Chicago Hogs At 14-Year Low

Hog prices settled to new lows on the Chicago market during the week. The top price of \$12.25, paid for the best kinds Tuesday, was the lowest since January 31, 1942 and the average at \$10.90 was the lowest since December 30, 1941. The day's peak represented a 65c decline from Monday, while the average was off 75c.

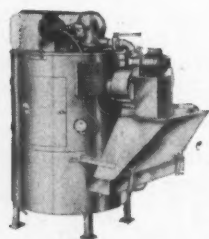
U.S. Surplus Lard To Brazil

About 11,000,000 lbs. of lard are included in a recent United States deal with Brazil which calls for the shipment of about \$41,000,000 worth of U.S. surplus farm commodities to that South American country.

"We know we can count on our JULIANS"



**The Smokehouse
the Industry
Stays
Sold On**



We distribute the famous MEPACO "TIPPER" SMOKERS

The best there is . . . by any standards and at any cost! Provides cool, clean, dry smoke in uniform, controlled volume—at a saving in fuel and with a minimum of attention. Built to last a life-time.

West Coast Representative: Meat Packers Equipment Co., 1226 49th Ave., Oakland 1, Calif.
Canadian Representative: McLean Machinery Co., Ltd., Winnipeg, Canada

Chicago Distributors: WORTHINGTON CORPORATION (ammonia refrigeration equipment)

JOHN ENGELHORN & SONS
Engelhorn's



PORK PACKERS SINCE 1875

October 10, 1955

Julian Engineering Company
5445 N. Clark Street
Chicago 40, Illinois

Att: Mr. John Julian

Gentlemen:

We wish to state that we are now using seven (7) Julian smoke-houses at our Newark plant and another is presently being installed at our North Bergen plant.

These smokehouses work very satisfactorily, uniform color and temperatures, with a very minimum of maintenance.

We know we can count on our Julians to give us the most dependable operation and the most saleable meat products.

You may be assured that any further smokehouses we may require will be Julian Smokehouses.

Very truly yours,

JOHN ENGELHORN & SONS

Fred Engelhorn
Fred Engelhorn
President

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JULIAN
ENGINEERING
COMPANY

5445 No. Clark St.
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• manufacturers and contractors for:
smokehouses . . . process piping . . . refrigeration

PROCESSED MEATS... SUPPLIES

October Volume of Meat Foods Processed Shows Gain Over Last Year; Canning Up

PREPARATION and processing of meat and meat food products in the four weeks of October was done on a more expansive scale than in the same period of last year. Total volume of all product handled amounted to 1,408,200,000 lbs. compared with 1,298,288,000 lbs. last year. Increases were fairly general on all items processed, with the volume of sausage

reaching 129,316,000 lbs. This was nearly 7,000,000 lbs. more than last year.

Processors handled 59,520,000 lbs. of steaks, chops and roasts as against 54,945,000 lbs. in the same four weeks of last year. The larger supply of raw materials available this year helped raise the amount of bacon sliced to 73,743,000 lbs. from 66,695,000 lbs.

in the same period, last year.

Renderers turned out a total of 170,662,000 lbs. of lard for about an 11 per cent gain over the 153,023,000 lbs. a year earlier.

Total volume of all meat and meat products canned under federal inspection amounted to 41,781,000 lbs. in the 3-lb. and larger cans and 127,016,000 lbs. in the under-3-lb. containers compared with 40,792,000 and 110,547,000 lbs. last year. There was little change in the volume of luncheon meat and hams canned.

MEATS AND MEAT FOOD PRODUCTS PREPARED AND PROCESSED UNDER FEDERAL INSPECTION—OCTOBER 3 THROUGH OCTOBER 29, 1955 COMPARED WITH CORRESPONDING PERIOD, OCTOBER 3 THROUGH OCTOBER 30, 1954

	1955 Oct. 2-Oct. 29	1954 Oct. 3-Oct. 30	43 Weeks 1955	43 Weeks 1954
Placed in cure—				
Beef	13,321,000	15,896,000	129,610,000	130,370,000
Pork	297,239,000	288,488,000	2,984,690,000	2,585,131,000
Other	119,000	124,000	1,869,000	1,512,000
Smoked and/or dried—				
Beef	4,150,000	4,490,000	50,142,000	48,505,000
Pork	204,348,000	192,774,000	2,084,863,000	1,814,671,000
Cooked Meat—				
Beef	6,714,000	5,793,000	62,762,000	60,412,000
Pork	23,486,000	21,449,000	281,691,000	214,718,000
Other	304,000	375,000	4,056,000	3,277,000
Sausage—				
Fresh finished	21,944,000	19,290,000	182,311,000	164,530,000
To be dried or semi-dried	11,596,000	10,543,000	112,197,000	107,673,000
Franks, wieners	45,865,000	43,169,000	516,472,000	482,280,000
Other, smoked, or cooked	49,945,000	49,516,000	521,539,000	519,649,000
Total sausage	129,316,000	122,518,000	1,333,519,000	1,274,130,000
Loaf, head cheese, chili, jellied products	17,002,000	16,057,000	172,094,000	164,897,000
Steaks, chops, roasts	59,520,000	54,945,000	544,254,000	515,944,000
Bouillon cubes, extract	144,000	144,000	1,592,000	2,949,000
Sliced bacon	73,743,000	66,695,000	777,808,000	635,291,000
Sliced, other	12,232,000	9,785,000	120,190,000	88,396,000
Hamburger	12,772,000	11,792,000	130,115,000	128,757,000
Miscellaneous meat product	6,924,000	4,539,000	51,260,000	87,580,000
Lard, rendered	170,662,000	153,023,000	1,549,586,000	1,326,502,000
Lard, refined	118,000,000	115,424,000	1,184,822,000	1,049,554,000
Oleo stock	8,706,000	8,434,000	95,608,000	96,219,000
Edible tallow	12,496,000	11,929,000	131,830,000	124,156,000
Rendered pork fat—				
Rendered	8,716,000	8,326,000	85,378,000	76,624,000
Refined	4,856,000	5,079,000	62,067,000	46,180,000
Compound containing animal fat	47,549,000	42,746,000	415,703,000	357,111,000
Oleomargarine containing animal fat	2,867,000	3,041,000	32,641,000	25,404,000
Canned product (for civilian use and Dept. of Defense)	172,407,000	153,307,000	1,601,097,000	1,528,450,000
Total	1,408,200,000	1,298,288,000	13,712,679,000	12,235,498,000

*This figure represents "inspection pounds" as some of the products may have been inspected and recorded more than once due to having been subjected to more than one distinct processing treatment, such as curing first and then canning.

MEAT AND MEAT FOOD PRODUCTS CANNED UNDER FEDERAL INSPECTION IN THE FOUR-WEEK PERIOD, OCTOBER 2 THROUGH OCTOBER 29, 1955

	Pounds of finished product	Slicing and institutional sizes (3 lbs. or over)	Consumer packages or shelf sizes (under 3 lbs.)
Luncheon meat	12,331,000	10,501,000	10,501,000
Canned hams	20,605,000	622,000	622,000
Corned beef hash	359,000	6,094,000	6,094,000
Chili con carne	1,272,000	15,939,000	15,939,000
Viennas	273,000	5,046,000	5,046,000
Franks, wieners in brine	2,000	427,000	427,000
Deviled ham .....	.....	687,000	687,000
Other potted or deviled meat food products .....	.....	2,340,000	2,340,000
Tamales	196,000	2,933,000	2,933,000
Sliced dried beef	35,000	345,000	345,000
Chopped beef	8,000	1,899,000	1,899,000
Meat stew (all product)	84,000	7,582,000	7,582,000
Spaghetti meat products	196,000	7,415,000	7,415,000
Hamburger, roasted or pickled	44,000	184,000	184,000
Vinegar pickled products	1,166,000	1,497,000	1,497,000
Bulk sausage	40,000	701,000	701,000
Hamburger, roasted or corned beef, meat and gravy	601,000	2,978,000	2,978,000
Soups	1,418,000	39,650,000	39,650,000
Sausage in oil	533,000	347,000	347,000
Tripe .....	.....	357,000	357,000
Brains .....	.....	258,000	258,000
Loins and picnics	1,824,000	55,000	55,000
All other meat with meat and/or meat by-products — 20% or more	231,000	7,335,000	7,335,000
Less than 20%	505,000	10,944,000	10,944,000
Totals	41,781,000	127,016,000	127,016,000

DOMESTIC SAUSAGE

(l.c.l. prices)	
Pork sausage, hog cas.	44
Pork sausage, bulk	29 @ 32½
Pork sausage, sheep cas.	48 @ 56
1-lb. pkge.	48 @ 56
5/8-lb. pkge.	46 @ 52
Frankfurters, sheep cas.	46½ @ 57
Frankfurters, skinless	38 @ 39
Bologna (ring)	39 @ 41
Bologna, artificial cas.	31 @ 32½
Smoked liver, hog bungs.	42½ @ 44
Smoked liver, art. cas.	35 @ 35½
New Eng. lunch., spec.	55 @ 59
Polish sausage, smoked	51 @ 57
Tongue and blood	42½ @ 48
Olive loaf	44½ @ 46
Pepper loaf	51½ @ 58
Pickle & Pimiento loaf	39 @ 40½

SEEDS AND HERBS

(l.c.l. prices)	Whole	Ground for sausage
Caraway seed	25	30
Cominos seed	22	27
Mustard seed, fancy	23	
Yellow American	18	
Oregano	34	
Coriander		
Morocco	22	26
Marjoram, French	46	52
Sage, Dalmatian		
No. 1	58	66

DRY SAUSAGE

(l.c.l. prices)	
Cervelat, ch. hog bungs	87 @ 92
Thuringer	46 @ 49
Farmer	70 @ 73
Holsteiner	72 @ 75
B. C. Salami	77 @ 80
Pepperoni	65 @ 70
Genoa style salami, ch.	91 @ 94
Cooked Salami	40 @ 45
Sicilian	80 @ 84

SPICES

(Basis Chgo., orig. bbls., bags, bales)	Whole	Ground
Allspice, prime	1.03	1.12
Resifted	1.10	1.18
Chili Powder	47	41
Chili Pepper	41	37
Cloves, Zanzibar	59	65
Ginger, Jam., unbl.	72	76
Mace, fancy, Banda	3.25	3.50
West Indies	None qtd.	
East Indies	3.30	
Mustard flour, fancy	37	33
No. 1	33	
West India Nutmeg	80	
Paprika, Spanish	51	
Pepper, cayenne	54	
Pepper:		
Red, No. 1	53	53
White	58	61
Black	48	52

SAUSAGE CASINGS

(l.c.l. prices quoted to manufacturers of sausage.)	
Beef casings:	
Domestic rounds, 1½ to 1¼ inch	60 @ 80
Domestic rounds, over 1¼ inch, 140 pack.	75 @ 90
Export rounds, wide, over 1½ in.	1.25 @ 1.50
Export rounds, med., 1½ @ 1½ in.	85 @ 1.15
Export rounds, narrow, 1¼/down	1.00 @ 1.25
No. 1 weas., 24 in. up.	12 @ 16
No. 2 weas., 22 in. up.	9 @ 13
No. 2 weasands	8 @ 10
Middles, sew, 1½ @ 2¼ inch	1.25 @ 1.50
Middles, select, wide, 2 @ 2½ inch	1.75 @ 2.10
Middles, extra select, 2¼ @ 2½ inch	1.85 @ 2.50
Beef bungs, exp. No. 1	25 @ 34
Beef bungs, domestic	20 @ 25
Dried or salt, bladders, piece:	
8-10 in. wide, flat	9 @ 11
10-12 in. wide, flat	9 @ 11
12-15 in. wide, flat	14 @ 18
Pork casings:	
Extra narrow, 20 mm.	
& down	4.00 @ 4.35
Narrow, medium, 29 @ 32 mm.	3.70 @ 4.15
32 @ 35 mm.	2.30 @ 2.60
Spec. med., 35 @ 38 mm.	1.50 @ 1.85

Sow bungs	54 @ 58
Export bungs, 34 in. cut	45 @ 52
Lge. pr. bungs, 34 in.	27 @ 34
Med. prime bungs, 34 in. cut	20 @ 26
Small prime bungs	12 @ 14
Hog middles, 1 per set, cap. off	55 @ 70
Sheep casings (per hank):	
26/28 mm.	5.15 @ 5.75
24/26 mm.	5.50 @ 5.85
22/24 mm.	4.75 @ 5.15
20/22 mm.	3.85 @ 4.25
18/20 mm.	2.75 @ 2.95
16/18 mm.	1.75 @ 2.25

CURING MATERIALS

	Cwt.
Nitrite of soda, in 400-lb. bbls., del. or f.o.b. Chgo.	\$10.31
Pure rfd., gran. nitrate of soda	5.65
Pure rfd. powdered nitrate of soda	8.65
Salt, in min. car, of 45,000 lbs., only paper sacked f.o.b. Chgo. gran., ton	28.00
Rock, per ton in 100-lb. bags, f.o.b. whse., Chgo.	26.00
Sugar	
Raw, 96 basis, f.o.b. N.Y.	5.98
Refined standard cane gran., basis (Chgo.)	8.50
Packers, curing sugar, 100-lb. bags, f.o.b. Reserve, La.	8.35
less 2%	
Dextrose, per cwt.	
Cerelose, Reg. No. 53	7.55
Ex-W'h'se., Chicago	7.65

BEEF-VEAL-LAMB... Chicago and outside

CHICAGO

Nov. 21, 1955

WHOLESALE FRESH MEATS

CARCASS BEEF

(L.C.I. prices)	
Native steer:	
Prime, 600/800	36 1/4
Choice, 500/700	35 1/2
Choice, 700/800	34 1/2
Good, 500/700	32 1/2
Commercial cow	21 1/2
Bull	24
Canner & cutter cows	19 1/2

PRIMAL BEEF CUTS

Prime:	
Hindqtrs., 5/800	47n
Foreqtrs., 5/800	20n
Rounds, all wts.	42
Trd. loins, 50/70 (lcl) 72	@75
Sq. chucks, 70/90	30n
Arm chucks, 80/110	28n
Briskets (lcl)	25
Ribs, 25/35 (lcl)	@54
Navel, No. 1	11
Flanks, rough No. 1	13

Choice:	
Hindqtrs., 5/800	42 1/2
Foreqtrs., 5/800	@28 1/2
Rounds, all wts.	@41
Trd. loins, 50/60 (lcl) 59	@31
Sq. chucks, 70/90	30
Arm chucks, 80/110	28
Briskets (lcl)	25
Ribs, 25/35 (lcl)	@49
Navel, No. 1	11
Flanks, rough No. 1	13
Good:	
Rounds	40 @41
Sq. cut chucks	29 @30
Briskets	23 @24
Ribs	44 @47
Loins	54 @57

COW & BULL TENDERLOINS

Fresh J/L	O-O Grade	Fros. C/L
60@63	Cows, 3/dn.	59@61
70@77	Cows, 3/4	62@64
75@82	Cows, 3/5	70@72
85@90	Cows, 5/up	85@88
85@90	Bulls, 5/up	85@88

BEEF HAM SETS

Insides, 12/up	39
Outsides, 8/up	35 1/2
Knuckles, 7 1/2/up	39

CARCASS MUTTON

(L.C.I. prices)	
Choice, 70/down	16@17
Good, 70/down	15@16

PACIFIC COAST WHOLESALE MEAT PRICES

FRESH BEEF (Carcass):	Los Angeles	San Francisco	No. Portland
	Nov. 22	Nov. 22	Nov. 22
STEER:			
Choice:			
500-600 lbs.	\$34.00@35.00	\$35.00@37.00	\$38.00@40.00
600-700 lbs.	33.00@34.00	33.00@35.00	35.00@37.00
Good:			
500-600 lbs.	31.00@33.00	32.00@34.00	33.00@37.00
600-700 lbs.	30.00@32.00	30.00@32.00	32.00@36.00
Commercial:			
350-600 lbs.	29.00@32.00	28.00@30.00	29.00@33.00
COW:			
Commercial, all wts.	21.00@23.00	23.00@27.00	22.00@28.00
Utility, all wts.	19.00@22.00	20.00@23.00	20.00@26.00
Canner-cutter	None quoted	17.00@20.00	18.00@20.00
FRESH CALF (Skin-off)			
Choice:			
200 lbs. down	36.00@39.00	33.00@35.00	33.00@37.00
Good:			
200 lbs. down	34.00@37.00	32.00@34.00	30.00@34.00
LAMB (Carcass):			
Prime:			
40-50 lbs.	38.00@41.00	39.00@41.00	37.00@40.00
50-60 lbs.	38.00@39.00	37.00@39.00	37.00@40.00
Choice:			
40-50 lbs.	38.00@41.00	39.00@41.00	37.00@40.00
50-60 lbs.	38.00@39.00	37.00@39.00	37.00@40.00
Good, all wts.	35.00@39.00	35.00@38.00	35.00@38.00
MUTTON (EWE):			
Choice, 70 lbs. down	18.00@20.00	None quoted	12.00@14.00
Good, 70 lbs. down	18.00@20.00	None quoted	12.00@14.00

BEEF PRODUCTS

Tongues, No. 1, 100's	27 @29 1/2
Hearts, reg., 100's	11
Livers, sel., 30/50's	24 @24 1/2
Livers, reg., 35/50's	16
Lips, scalded, 100's	8
Lips, unsalted, 100's	7
Tripe, scalded, 100's	5
Tripe, cooked, 100's	5 1/2
Lungs, 100's	5 1/2 @ 5 1/2
Melts, 100's	5 1/2 @ 5 1/2
Udders, 100's	4 1/2

FANCY MEATS

(L.C.I. prices)	
Beef tongues, corned	35
Veal breads, under 12 oz.	57
12 oz. up	92
Calf tongue, 1 lb./down	18 1/2
Ox tails, under 1/2 lb.	13
Ox tails, over 1/2 lb.	16

BEEF SAUS. MATERIALS

FRESH

C. C. cow meat, bbls.	28 1/2 @30
Bull meat, bon'ls, bbls.	38
Beef trim., 75/85, bbls.	21
Beef trim., 85/90, bbls.	25 1/2
Bon'ls chucks, bbls.	29 @29 1/2
Beef cheek meat,	
lrm'd, bbls.	17
Beef head meat, bbls.	16 1/2
Shank meat, bbls.	31
Veal trim., bon'ls, bbls.	23 1/2 @24

VEAL—SKIN OFF

(Carcass)	
(L.C.I. prices)	
Prime, 30/110	\$39.00@40.00
Prime, 110/150	38.00@39.00
Choice, 50/80	27.00@31.00
Choice, 80/110	34.00@36.00
Choice, 110/150	34.00@36.00
Good, 50/80	23.00@27.00
Good, 80/110	30.00@33.00
Good, 110/150	30.00@33.00
Commercial, all wts.	21.00@28.00

CARCASS LAMB

(L.C.I. prices)	
Prime, 40/50	40 @42 1/2
Prime, 50/60	39 @41 1/2
Choice, 40/50	40 @42 1/2
Choice, 50/60	39 @41 1/2
Good, all wts.	38 @41 1/2

NEW YORK

Nov. 22, 1955

WHOLESALE FRESH MEATS

BEEF CUTS

(L.C.I. prices)	
Steer:	
Prime carc., 6/700	\$38.00@40.00
Prime carc., 7/800	36.00@38.00
Choice carc., 6/700	36.00@38.00
Choice carc., 7/800	35.00@36.50
Hinds, pr., 6/700	47.00@50.00
Hinds, pr., 7/800	45.00@48.00
Hinds, ch., 6/700	45.00@48.00
Hinds, ch., 7/800	43.00@47.00

BEEF CUTS

(L.C.I. prices)	
Prime steer:	
Hindqtrs., 600/700	50.00 @ 52.0
Hindqtrs., 700/800	47.00 @ 50.0
Hindqtrs., 800/900	43.00 @ 46.0
Rounds, flank off	41.00 @ 43.0
Rounds, diamond bone,	
flank off	43.00 @ 45.0
Short loins, untrim.	60.00 @ 72.0
Short loins, trim.	52.00 @ 60.0
Flanks	14.00 @ 15.0
Ribs (7 bone cut)	49.00 @ 56.0
Arm chucks	32.00 @ 34.0
Briskets	27.00 @ 29.0
Plates	12.00 @ 13.0
Foreqtrs., (Kosher)	36.00 @ 38.0
Arm Chucks (Kosher)	35.00 @ 39.0

Choice steer:	
Hindqtrs., 600/700	47.00 @ 50.0
Hindqtrs., 700/800	44.00 @ 48.0
Hindqtrs., 800/900	42.00 @ 44.0
Rounds, flank off	41.00 @ 42.0
Rounds, diamond bone,	
flank off	42.00 @ 44.0
Short loins, untrim.	55.00 @ 62.0
Short loins, trim.	70.00 @ 85.0
Flanks	13.00 @ 14.0
Ribs (7 bone cut)	45.00 @ 54.0
Arm Chucks	31.00 @ 35.0
Briskets	26.00 @ 28.0
Plates	12.00 @ 13.0
Foreqtrs., (Kosher)	33.00 @ 37.0
Arm Chucks (Kosher)	34.00 @ 37.0

N. Y. MEAT SUPPLIES

(Receipts reported by the USDA Marketing Service week ended Nov. 19, 1955 with comparisons.)

STEER AND HEIFER:	Carcass
Week ended Nov. 19	12,828
Week previous	9,872
COW:	
Week ended Nov. 19	1,569
Week previous	1,862
BULL:	
Week ended Nov. 19	287
Week previous	355
VEAL:	
Week ended Nov. 19	15,564
Week previous	9,226
LAMB:	
Week ended Nov. 19	31,438
Week previous	23,018
MUTTON:	
Week ended Nov. 19	748
Week previous	722
HOG AND PIG:	
Week ended Nov. 19	9,197
Week previous	9,641
PORK CUTS:	
Week ended Nov. 19	1,657,346
Week previous	1,098,402
BEEF CUTS:	
Week ended Nov. 19	204,173
Week previous	113,579
VEAL AND CALF CUTS:	
Week ended Nov. 19	3,900
Week previous	4,631
LAMB AND MUTTON:	
Week ended Nov. 19	9,523
Week previous	10,920
BEEF CURED:	
Week ended Nov. 19	14,165
Week previous	.....
PORK CURED AND SMOKED:	
Week ended Nov. 19	386,009
Week previous	207,380
LARD AND PORK FAT:	
Week ended Nov. 19	6,000
Week previous	5,190
LOCAL SLAUGHTER	
CATTLE:	
Head	14,058
Week previous	10,630
CALVES:	
Head	12,108
Week previous	11,148

FANCY MEATS

(L.C.I. prices)	
Veal breads, under 6 oz.	51
6/12 oz.	52
12 oz./up	54
Beef livers, selected	28
Beef kidneys	12
Oxtails, 1/2 lb./up, fros.	12

LAMB

(L.C.I. carcass prices)	
	City
Prime, 30/40	\$44.00@45.00
Prime, 40/45	45.00@48.00
Prime, 45/55	44.00@46.00
Choice, 30/40	42.00@43.00
Choice, 40/45	43.00@47.00
Choice, 45/55	42.00@45.00
Good, 30/40	40.00@42.00
Good, 40/45	42.00@44.00
Good, 45/55	39.00@41.00
Good, 55/65	37.00@38.00
Western	
Prime, 45/dn.	\$39.00@41.00
Prime, 45/55	40.00@42.00
Choice, 45/dn.	39.00@41.00
Choice, 45/55	40.00@42.00
Choice, 55/65	37.00@38.00
Good, 45/dn.	37.00@38.00
Good, 45/55	38.00@39.00
Good, 55/65	36.00@38.00

VEAL—SKIN OFF

(L.C.I. carcass prices)	
	Western
Prime, 80/130	\$39.00@42.00
Choice, 80/130	33.00@37.00
Good, 50/80	23.00@25.00
Good, 80/130	28.00@32.00
Com'l, 50/80	22.00@23.00
Com'l, 80/130	23.00@24.00
Choice calf, 130/170	26.00@28.00

BUTCHER'S FAT

Shop fat (cwt.)	\$2.00
Breast fat (cwt.)	3.00
Edible suet (cwt.)	3.25
Indedible suet (cwt.)	3.25

HOGS:	
Week ended Nov. 19	65,313
Week previous	51,098

SHEEP:	
Week ended Nov. 19	51,540
Week previous	43,673

COUNTRY DRESSED MEAT

VEAL:	Carcasses
Week ended Nov. 19	8,214
Week previous	5,850
HOGS:	
Week ended Nov. 19	402
Week previous	233
LAMB AND MUTTON:	
Week ended Nov. 19	271
Week previous	216

PHILA. FRESH MEATS

Nov. 21, 1955

WESTERN DRESSED	
STEER CARCASS: (Cwt.)	
Choice, 500/700	\$37.50@38.50
Choice, 700/900	35.50@37.50
Good, 500/800	34.00@35.50
COW:	
Com'l, all wts.	25.00@27.00
Utility, all wts.	22.00@23.00
VEAL (SKIN OFF):	
Choice, 80/110	36.00@38.00
Choice, 110/150	37.00@39.00
Good, 50/80	30.00@32.00
Good, 80/110	32.00@34.00
Good, 110/150	32.00@35.00
LAMB:	
Prime, 30/45	42.00@44.00
Prime, 45/55	42.00@44.00
Choice, 30/45	42.00@44.00
Choice, 45/45	42.00@44.00
Good, all wts.	39.00@42.00
MUTTON (EWE):	
Choice, 70/down	17.00@19.00
Good, 70/down	16.00@18.00
LOCALLY DRESSED	
STEER BEEF (lb.):	
Hinds, 500/800	43@47 41@45
Hinds, 800/900	42@44 40@43
Rounds, no flank	42@45 41@43
Hip rd., + flank	41@44 40@42
Full loin, untrim.	42@46 40@44
Short loin, untrim.	50@58 46@50
Ribs (7 bone)	45@50 43@45
Arm chucks	31@34 29@31
Briskets	27@30 27@30
Short plates	12@14 12@14

PORK AND LARD... Chicago and outside

CHICAGO PROVISION MARKETS

From The National Provisioner Daily Market Service

CASH PRICES

(Cariot Basis, Chicago Price Zone, Nov. 22, 1955)

SKINNED HAMS

Fresh or F.F.A.	Frozen
39 10/12	39
36 12/14	36
34 14/16	34 1/2
32 16/18	32 1/2
32 18/20	32
32 20/22	32 1/2 n
32 22/24	32 1/2 n
32 24/26	32 1/2 n
32 26/28	32 n
27 25/up, 2's in.	27 1/2 n

Note—Regular Hams 2 1/2¢ under skinned.

PICNICS

Fresh or F.F.A.	Frozen
21 4/6	21
18 6/8	18 1/2
17 8/10	17 1/2 @ 18
15 10/12	15
17 12/14	17 n
17 8/up, 2's in.	17 n

FAT BACKS

Fresh or Frozen	Cured
8 8/10	8 3/4
8 10/12	8 1/2 @ 9 1/4
10 12/14	11 @ 11 1/4
14 14/16	14 1/2 n
14 16/18	14 1/2 n
14 18/20	14 1/2 n
14 20/22	14 1/2 n

BELLIES

Fresh or F.F.A.	Frozen
23 6/8	23 1/2 n
23 8/10	23 1/2
18 10/12	19 1/2
18 12/14	18 1/2
16 14/16	16
15 16/18	15
14 18/20	14 1/2

GR. AMN. BELLIES D.S. BELLIES

			Clear
13 $\frac{1}{2}$ n	.....	18/20	..... 16n
13 $\frac{1}{2}$ n	.....	20/25	..... 16n
12 $\frac{1}{2}$ n	.....	25/30	..... 16n
10 $\frac{1}{2}$	.....	30/35	..... 16n
10 $\frac{1}{2}$	.....	35/40	..... 14 $\frac{1}{2}$ n
10 $\frac{1}{2}$	.....	40/50	..... 14n

FRESH PORK CUTS

Job Lot	Car Lot
31 1/2 @ 32 1/2	Loins 12 31 1/2 @ 32
30 1/2 @ 31 1/2	Loins 16/20 30 1/2 @ 30 1/2
31 1/2 @ 32 1/2	Loins 20/up 30 1/2 @ 31
24 1/2 @ 25 1/2	Bost. Butts, 4/8, 25
24 1/2 @ 25 1/2	Bost. Butts, 8/12, 25 n
24 1/2 @ 25 1/2	Bost. Butts, 8/up, 25 n
20 1/2 @ 21 1/2	Ribs, 3/dn, 28
25 1/2 @ 26 1/2	Ribs, 5/up, 27 n
20 1/2 @ 21 1/2	Ribs, 5/up, 27 n

OTHER CELLAR CUTS

Fresh or Frozen	Cured
8 1/2 Square Jowls	unq.
6 1/2 Jowl Butts, loose	7 n
7 1/2 Jowl Butts, boxed	unq.

LOWER PORK PRICES CUT HOG VALUES

(Chicago costs and credits, first day of the week.)

Lower live hog prices failed to offset markdowns in pork this week, resulting in partial losses of the previous week's gains. Lean cuts were down the most in price, with those from heavy hogs showing the biggest declines.

	—180-220 lbs.—	—220-240 lbs.—	—240-270 lbs.—
	Value	Value	Value
Lean cuts	per cwt. \$ 9.76	per cwt. \$ 9.17	per cwt. \$ 8.83
Fat cuts, lard	per cwt. 4.05	per cwt. 4.06	per cwt. 3.74
Ribs, trimmings, etc.	per cwt. 1.44	per cwt. 1.40	per cwt. 1.28
Cost of hogs	\$ 2.25	\$ 1.95	\$ 1.80
Condemnation loss	.02	.02	.02
Handling, overhead	1.57	1.39	1.26
TOTAL COST	\$13.84	\$12.51	\$12.58
TOTAL VALUE	15.25	14.63	13.85
Cutting margin	+\$1.41	+\$2.01	+\$1.27
Margin last week	+ 1.81	+ 2.50	+ 1.97

PACIFIC COAST WHOLESALE PORK PRICES

	Los Angeles	San Francisco	No. Portland
	Nov. 22	Nov. 22	Nov. 22
FRESH PORK Carcasses: (Packer Style)		(Shipper Style)	(Shipper Style)
80-120 lbs., U.S. 1-3	None quoted	\$26.00@28.00	None quoted
120-170 lbs., U.S. 1-3	\$23.50@25.00	23.00@26.00	\$22.00@23.50

FRESH PORK CUTS No. 1:

LOINS:	(Smoked)	(Smoked)	(Smoked)
8-10 lbs.	35.00@38.00	38.00@42.00	38.00@42.00
10-12 lbs.	35.00@38.00	38.00@42.00	38.00@42.00
12-16 lbs.	32.00@36.00	40.00@43.00	37.00@40.00

PICNICS:	(Smoked)	(Smoked)	(Smoked)
4-8 lbs.	27.00@35.00	30.00@34.00	32.00@35.00

HAMS, skinned:			
12-16 lbs.	44.00@48.00	48.00@50.00	46.50@51.00
16-18 lbs.	44.00@48.00	45.00@47.00	46.00@50.00

BACON, "Dry" Cure No. 1:			
6-8 lbs.	36.00@42.00	48.00@52.00	40.00@44.00
8-10 lbs.	34.00@39.00	44.00@48.00	38.00@41.00
10-12 lbs.	32.00@38.00	40.00@44.00	38.00@40.00

LARD, Refined:			
1-lb. cartons	15.00@17.50	18.00@19.00	14.50@16.50
50-lb. cartons & cans	14.50@17.00	16.00@18.00	None quoted
Tierces	13.50@16.50	16.00@17.00	13.00@15.50

N.Y. FRESH PORK CUTS

Nov. 22, 1955
(L.C.I. prices)

	Western
Pork loins, 8/12	\$34.00@37.00
Pork loins, 12/16	34.00@35.00
Hams, sknd., 10/14	43.00@45.00
Boston butts, 4/8	30.00@32.00
Spareribs, 3/down	32.00@34.00
Pork trim., regular	28.00
Pork trim., spec. 80%	44.00

	Box lots
Hams, sknd., 10/14	\$40.00@45.00
Pork loins, 8/12	36.00@41.00
Pork loins, 12/14	36.00@39.00
Picnics, 4/8	25.00@28.00
Boston butts, 4/9	32.00@36.00
Spareribs, 3/down	33.00@40.00

N. Y. DRESSED HOGS

(L.C.I. prices)
(Hends on, leaf fat in)

50 to 75 lbs.	\$22.50@25.50
75 to 100 lbs.	22.50@25.50
100 to 125 lbs.	22.50@25.50
125 to 150 lbs.	22.50@25.50

CHGO. WHOLESALE

SMOKED MEATS

Nov. 22, 1955

Hams, skinned, 14/16 lbs., wrapped	42
Hams, skinned, 14/16 lbs., ready-to-eat, wrapped	44
Hams, skinned, 16/18 lbs., wrapped	41
Hams, skinned, 16/18 lbs., ready-to-eat, wrapped	43
Bacon, fancy trimmed, brisket off, 8/16 lbs., wrapped	35
Bacon, fancy sq. cut, seedless, 12/14 lbs., wrapped	33
Bacon, No. 1 mixed, 1-lb. open-faced layers	43

PHILA. FRESH PORK

Nov. 21, 1955

	WESTERN DRESSED
PORK CUTS—U.S. 1-3, Lb.:	
Regular loins, 8/12	33@35
Regular loins, 12/16	33@35
Regular loins, 16/20	32@34
Butts, Boston, 4/8	27@30
Spareribs, 3/down	32@34
Reg. Picnics	25@27

LOCALLY DRESSED

	U.S. 1-3 Lb.
Pork loins, 8/12	35@38
Pork loins, 12/16	35@38
Bellies, 10/12	26@28
Spareribs, 3/dn.	33@36
Sk. hams, 10/12	46@48
Sk. hams, 12/14	44@46
Picnics, 4/8	24@26
Boston butts, 4/8	30@32

HOG-CORN RATIOS

The hog-corn ratio for barrows and gilts at Chicago for the week ended November 19, 1955 was 10.3, the USDA has reported. This ratio compared with the 10.9 ratio for the preceding week and 12.8 a year ago. These ratios were calculated on the basis of No. 3 yellow corn selling at \$1.170, \$1.200 and \$1.469 per bu. during the three periods, respectively.

LARD FUTURES PRICES

NOTE: Add 1/2¢ to all price quotations ending in 2 or 7.

FRIDAY, NOV. 18, 1955

	Open	High	Low	Close
Nov. 11.65	11.77	11.25	11.60	
-60			-25	
Dec. 11.62	11.62	11.40	11.40	
Jan. 11.40	11.50	11.40	11.50	
Mar. 11.70	11.70	11.60	11.65-62	
May 11.67	11.67	11.65	11.65a	

Sales: 12,080,000 lbs.
Open interest at close Thurs., Nov. 17: Nov. 119, Dec. 443, Jan. 203, Mar. 394, and May 148 lots.

MONDAY, NOV. 21, 1955

Dec. 11.45	11.45	11.25	11.32b
Jan. 11.47	11.47	11.25	11.35b
Mar. 11.05	11.05	11.45	11.47b
-62			
May 11.55	11.55	11.47	11.50b

Sales: 4,280,000 lbs.
Open interest at close Fri., Nov. 18: Nov. 30, Dec. 456, Jan. 210, Mar. 414, and May 149 lots.

TUESDAY, NOV. 22, 1955

Dec. 11.25	11.27	11.15	11.20a
-15			
Jan. 11.25	11.32	11.22	11.22b
Mar. 11.35	11.50	11.35	11.40
May 11.45	11.55	11.45	11.47-50

Sales: 7,080,000 lbs.
Open interest at close Mon., Nov. 21: Nov. 16, Dec. 438, Jan. 218, Mar. 421, and May 152 lots.

WEDNESDAY, NOV. 23, 1955

Dec. 11.15-17	11.17	10.95	10.97-95
Jan. 11.20	11.20	11.05	11.10a
Mar. 11.32	11.37	11.25	11.32
May 11.42	11.45	11.32	11.42b

Sales: 9,000,000 lbs.
Open interest at close Wed. Nov. 23: Nov. 16, Dec. 433, Jan. 211, Mar. 414, and May 142 lots.

THURSDAY, NOV. 24, 1955

(Thanksgiving Day)
Board of Trade Closed
No Trading in Lard Futures

CHGO. FRESH PORK AND PORK PRODUCTS

Nov. 21, 1955
(L.C.I. prices)

Hams, skinned, 10/12	41
Hams, skinned, 12/14	37 @ 38
Hams, skinned, 14/16	36
Picnics, 4/6 lbs., loose	23
Picnics, 6/8 lbs.	20 @ 21
(Job Lot)	
Pork loins, bon's, 100's	62
Shoulders, 16/dn., loose	23 1/2
Pork livers	11 @ 11 1/2
Tenderloins, fresh, 10's	75
Neck bones, blbs.	6 @ 6 1/2
Ears, 30's	9 @ 10
Feet, 30's 30's	5 1/2 @ 6

CHGO. PORK SAUSAGE

MATERIALS—FRESH

(To Sausage Manufacturers in job lots only)

Pork trim., reg. 40%	11 @ 12
Pork trim., guar. 80%	12 1/2
Pork trim., 80% lean	24 1/2
Pork trim., 95% lean	36
Pork head meat	15 1/2
Pork cheek meat, trim.	23
blbs.	

PACKERS' WHOLESALE

LARD PRICES

Refined lard, tierces, f.o.b. Chicago	\$13.50
Refined lard, 50-lb. cartons, f.o.b. Chicago	13.25
Kettle rendered tierces, f.o.b. Chicago	14.00
Leaf kettle rendered tierces, f.o.b. Chicago	14.50
Lard flakes, f.o.b. Chicago	15.75
Neutral tierces, f.o.b. Chicago	15.75
Standard shortening, N. & S. (dcl.)	18.60
Hydro. shortening, N. & S.	19.25

WEEK'S LARD PRICES

	P.S. or Ref. in	P.S. or Ref. in
	Dry	Dry
	50-lb.	50-lb.
	Render.	Render.
	(Tierces)	(Tierces)
	(Open)	(Open)
	(Bd. Trade)	(Mkt.)
Nov. 18	11.75n	9.37 1/2 n
Nov. 19	11.75n	9.37 1/2 n
Nov. 20	11.75n	9.37 1/2 n
Nov. 21	11.62 1/2 n	9.75 n
Nov. 22	11.62 1/2 n	9.50 n
Nov. 23	11.62 1/2 n	9.50 n
Nov. 24	11.62 1/2 n	9.50 n

BY-PRODUCTS...FATS AND OILS

BY-PRODUCTS MARKET

Tuesday, Nov. 22, 1955

BLOOD
Unground, per unit of ammonia (bulk)*4.75@5.00n

DIGESTER FEED TANKAGE MATERIAL
Wet rendered, unground, loose:
Low test*5.00n
Med. test*4.75n
High test*4.27n
Liquid stick, tank cars*4.75

PACKINGHOUSE FEEDS

Carlota, ton
50% meat, bone scraps, bagged...\$ 62.50@ 72.50
50% meat, bone scraps, bulk... 60.00@ 67.50
55% meat scraps, bagged... 82.00
60% digester tankage, bagged... 72.50@ 77.50
60% digester tankage, bulk... 70.00@ 75.00
80% blood meal, bagged... 110.00@117.50
Steamed bone meal, bagged (spec. prep.) 85.00
60% steamed bone meal, bagged... 64.00

FERTILIZER MATERIALS

Feather tankage, ground, per unit ammonia 3.70
Hoof meal, per unit ammonia6.25@6.35

DRY RENDERED TANKAGE

Low test, per unit prot.*1.10n
Med. test, per unit prot.*1.05n
High test, per unit prot.*1.00n

GELATINE AND GLUE STOCKS

Calf trimmings (limed) 1.35@ 1.50
Hide trimmings (green salted) 6.00@ 7.00
Cattle jaws, scraps and knuckles, per ton55.00@57.00
Pig skin scraps and trimmings 5.00@ 5.50

ANIMAL HAIR

Winter coil dried, per ton*125.00@135.00
Summer coil dried, per ton*60.00@ 65.00
Cattle switches, per piece 4@5 1/4
Winter processed, gray, lbs. 20
Summer processed, gray, lb. 12 1/2@13 1/2

n—nominal. a—asked. *Quoted delivered.

TALLOWs and GREASES

Tuesday, Nov. 22, 1955

The Chicago inedible fats market was bid at steady levels late last week; however, sellers were reluctant in submitting offerings. A few tanks of regular production bleachable fancy tallow traded at 8 1/2c, delivered New York. Inquiry for all hog choice white grease for same destination was at 9@9 1/2c. Several tanks of edible tallow sold at 9 1/4c, Chicago basis.

On Friday a couple of tanks of edible tallow sold at 9 1/2c, f.o.b. outside point, with indications of 9 3/4c, Chicago in the market throughout the session. Several tanks of all hog choice white grease sold at 9 1/2c, c.a.f. New York. Additional tanks of regular production bleachable fancy tallow traded at 8 1/2c, and several tanks of hard body material at 8 1/2c, all c.a.f. East.

No change was registered at the start of the new week. Buyers were still persistent in picking up product at steady levels, and some makers released their tight hold on certain materials. Prime tallow sold at 7 1/4c, spe-

cial tallow at 7 1/2c and yellow grease at 7c, all c.a.f. Chicago. Edible tallow was reported available at 9 1/4c, Chicago, and met bids of 9 1/2c.

Bleachable fancy tallow was still bid at 8 1/2c and 8 3/4c, c.a.f. East, product considered. All hog choice white grease sold early at 9 1/2c, delivered New York. Later bids were at 9c, with offerings held 1/4c higher. A fair trade was consummated on edible tallow later in the day at 9 1/2c and 9 3/4c, Chicago basis.

On Tuesday, in a fair volume of trade, bleachable fancy tallow sold at 8 1/2c on regular production and 8 3/4c on hard body material, c.a.f. New York. Moderate trade was reported in the Midwest area. Bleachable fancy tallow sold at 8c, and No. 1 tallow at 7 1/4c, c.a.f. Chicago. Several tanks of all hog choice white grease traded at 9 1/2c, c.a.f. New York. Sellers asked 1/2c higher. Movement of edible tallow took place at 9 1/2c, Chicago and 9 3/4c, Chicago basis. Yellow grease was bid at 7c, Chicago.

TALLOWs: Tuesday's quotations: edible tallow, 9 1/2@9 3/4c; original fancy tallow, 8 1/4c; bleachable fancy tal-

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low, 8c; prime tallow, 7½c; special tallow, 7½c; No. 1 tallow, 7½c; and No. 2 tallow, 6¾@6½c.

GREASES: Tuesday's quotations: Not all hog choice white grease, 8@8¼c; B-white grease, 7½c; yellow grease, 7c; house grease, 6¾@6¼c; and brown grease, 6@6¼c. The all hog choice white grease was quoted at 9¼c, c.a.f. East.

EASTERN BY-PRODUCTS

New York, Nov. 22, 1955

Dried blood was quoted Tuesday at \$5 per unit of ammonia. Low test wet rendered tankage was listed at \$4.50 to \$4.60 per unit of ammonia and dry rendered tankage was priced at \$1.10 per protein unit.

N.Y. COTTONSEED OIL FUTURES

FRIDAY, NOV. 18, 1955

	Open	High	Low	Close	Prev. close
Dec.	13.20b	.....	.....	13.20b	13.20b
Jan.	13.20b	.....	.....	13.23b	13.25b
Mar.	13.42	.....	.....	13.39	13.43
May	13.45b	.....	.....	13.44	13.47
July	13.40b	.....	.....	13.35b	13.43
Sept.	13.15b	.....	.....	13.10b	13.20b
Oct.	13.10b	.....	.....	13.10b	13.10b

Sales: 200 lots.

MONDAY, NOV. 21, 1955

Dec.	13.18b	13.22	13.10	13.11	13.20b
Jan.	13.20b	.....	.....	13.10b	13.23b
Mar.	13.38b	13.43	13.32	13.32	13.39
May	13.39b	13.45	13.35	13.35	13.44
July	13.35b	13.40	13.28	13.28	13.35b
Sept.	13.10b	.....	.....	13.00b	13.10b
Oct.	13.10b	13.15	13.10	12.95b	13.10b

Sales: 128 lots.

TUESDAY, NOV. 22, 1955

Dec.	13.08b	13.06	13.06	13.02b	13.11
Jan.	13.05b	13.11	13.10	13.07b	13.10b
Mar.	13.26-30	13.33	13.24	13.24	13.32
May	13.33	13.35	13.26	13.27	13.35
July	13.22b	13.27	13.24	13.20b	13.28
Sept.	12.97b	.....	.....	12.95b	13.00b
Oct.	12.90b	.....	.....	12.90b	12.95b

Sales: 246 lots.

VEGETABLE OILS

Tuesday, Nov. 22, 1955

Crude cottonseed oil, carlots, f.o.b.	
Valley	10½pd
Southeast	11¼a
Texas	10½@11n
Corn oil in tanks, f.o.b. mills	11¼a
Peanut oil, f.o.b. mills	17½n
Soybean oil, f.o.b. mills	10½@11n
Coconut oil, f.o.b. Pacific Coast	10½pd
Cottonseed foots:	
Midwest and West Coast	2
East	2

OLEOMARGARINE

Tuesday, Nov. 22, 1955

White domestic vegetable	26
Yellow quarters	24
Milk churned pastry	24
Water churned pastry	23

OLEO OILS

(F.O.B. Chicago)

Prime oleo stearine (slack barrels) ..	10½@11¼
Extra oleo oil (drums)	13¼

pd—paid, n—nominal, b—bid, a—asked.

Shortening, Ed. Oil Shipments

Shipments of shortening and edible oil rose to 358,526,000 lbs. in October from 342,144,000 lbs. in September, the Institute of Shortening and Edible Oils has reported. Of the October total, 160,304,000 lbs., or 44.7 per cent was shortening and 181,210,000 lbs., or 50.5 per cent was edible oil.



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HIDES AND SKINS

Some hides sold at steady levels, while others trade ½c over last week's levels—Small packer production sold steady to higher, with speculators reportedly active—Country hide prices improved. Sheepskins steady to easier.

CHICAGO

PACKER HIDES: Only one major packer was involved in hide trading on Monday, and a couple of selections on the hide list sold steady to higher. River heavy native steers sold steady at 13c, and branded cows brought 11c, basis Northerns, ½c over last week's level. The quantity of each selection traded could not be confirmed, but was thought to be enough to establish the price structure. Buying interest for other selections was good, with steady prices bid generally. Sellers, however, asked ½c up on some selections and were not actively offering others.

There was improved activity in the hide market on Tuesday, particularly on branded cows at 11c, but not all selections on the list were traded early. Branded steers sold up ½c, and butts and heavy Texas steers brought 11½c, while Colorados sold at 11c. River heavy native steers continued to trade at 13c, and River heavy native cows brought 12c. Light native and ex-light native steers sold at 15½c and 18c, respectively, in a combination car. There was also additional trading of River heavy native cows at 12c and Northerns at 12½c.

SMALL PACKER AND COUNTRY HIDES: Some averages of small packer hides sold steady to higher this week, with some sources of the opinion that speculators were in the market, which accounted for the gains registered. The 48@50-and 50@52-lb. averages sold at 12c and 12½c, depending on production, in the Midwest, with later bids at 12½c reportedly refused. The 60-lb. average continued dull, but was quoted steady to higher at 10@10½c in the Midwest. There was some trading of country hides at improved levels, depending on freight point involved, with 50@52-lb. average straight locker butchers sold at 8c and 48@50-lb. averages at 8½c. Rendered hides were quoted higher at 7½@8c, depending on average, but sales were difficult to confirm.

CALFSKINS AND KIPSKINS: St. Louis heavy calf sold late last week at 45c, steady with previous trading. About 2,000 River overweight kipskins sold early Friday at 31c. Late

Friday, kip and overweights sold at 34c and 30½c, respectively. This week, the kipskin market appeared steady, but there were indications that the calfskin market might be in a weaker position. Definite bids, however, were lacking.

SHEEPSKINS: There was additional trading of sheepskins late last week at steady to easier levels. Good quality fall clips brought 3.00, while plainer quality moved at 2.75. The No. 1 shearlings sold at 2.50@2.75, the No. 2's at 1.60 and 1.75, and the No. 3's at .60. Dry pelts continued nominal at 20@21c, although offerings were reportedly priced higher. Pickled skins strong, with sheep quoted at 11.00@12.00, with choice lots offered at 12.50.

CHICAGO HIDE QUOTATIONS

	Week ended Nov. 22, 1955	Cor. Week 1954
PACKER HIDES		
Hvy. Nat. steers	13 @13½	10½@11
Lt. Nat. steers	15 @15½	13 @13½n
Hvy. Tex. steers	11½	10n
Ex. lgt. Tex.	15½n	14½n
Butt. brnd. steers	11½	10n
Col. steers	11	9½n
Branded cows	11 @11½	9½@10n
Hvy. Nat. cows	12 @13	10½@11n
Lt. Nat. cows	14 @15n	18n
Nat. bulls	10n	8 @8½n
Branded bulls	9n	7 @7½n
Calfskins		
Nor., 10/15	50n	35n
10/down	55n	40n
Kips, Nor., nat., 15/25	34n	23n

SMALL PACKER SKINS		
STEERS AND COWS:		
60 lbs. and over	10 @10½n	10n
50 lbs.	12 @12½n	11½n

SMALL PACKER SKINS		
Calfskins, all wts.	40 @42½n	23n
Kips, all wts.	23 @25n	17n

SHEEPSKINS		
Packer shearlings,		
No. 1	2.50@2.75	2.00@2.15
Dry Pelts	20@21n	27@28n
Horsehides, Untrim.	7.75@8.00n	7.00@7.50n

N.Y. HIDE FUTURES

	Open	High	Low	Close
Jan. ...	11.84b	11.98	11.95	11.95
Apr. ...	12.37b	12.50	12.45	12.48- 50
July ...	12.75b	...	...	12.90b- 95a
Oct. ...	13.10b	...	...	13.23b- 28a
Jan. ...	13.35b	...	...	13.50b- 65a
Apr. ...	13.70b	...	...	13.75b-14.00a

Sales: 10 lots.

MONDAY, NOV. 21, 1955				
Jan. ...	11.90b	12.04	12.04	12.01b- 05a
Apr. ...	12.40b	...	...	12.50b- 55a
July ...	12.80b	12.85	12.85	12.90b-13.00a
Oct. ...	13.10b	...	...	13.30b- 35a
Jan. ...	13.35b	13.63	13.63	13.60b- 70a
Apr. ...	13.55b	...	...	13.85b-14.00a

Sales: 6 lots.

TUESDAY, NOV. 22, 1955				
Jan. ...	12.12	12.12	12.10	12.13b- 20n
Apr. ...	12.62	12.70	12.62	12.63b- 65a
July ...	13.00b	...	...	13.05b- 15a
Oct. ...	13.30b	13.52	13.50	13.50b- 53a
Jan. ...	13.65b	...	...	13.75b- 85a
Apr. ...	13.85b	...	...	14.00b- 10n

Sales: 49 lots.

WEDNESDAY, NOV. 23, 1955				
Jan. ...	12.10b	12.20	11.95	11.95b-12.00n
Apr. ...	12.70	12.74	12.40	12.41b- 45a
July ...	13.10b	12.75	12.73	12.73
Oct. ...	12.50b	13.25	13.25	13.20b- 25a
Jan. ...	13.77b	...	...	13.45b- 60a
Apr. ...	14.00b	14.10	14.10	13.70b- 90n

Sales: 37 lots.

LIVESTOCK MARKETS...Weekly Review

Cattle, Hogs Chalk Up New Slaughter Records in October

Livestock slaughter under federal inspection in October, while showing a decline in cattle butchering from that for September, established a new high for the month. October hog slaughter, under a 19 per cent gain over last September, and October 1954, resulted in a new all-time record for the month. It was also the largest hog kill since January, 1953. Calf slaughter numbered the largest of the year so far and that of sheep was below September and last year.

Inspected packers butchered a total of 1,692,772 head of cattle in October, or considerably fewer than the 1,751,619 killed in September. However, the past month's kill, a new record for the month, was moderately larger than the 1,616,193-head kill of last year for October. Ten-month total slaughter of cattle at 15,776,538 exceeded the previous record of 15,291,800 established last year.

Calf slaughter at 727,738 head, the largest for any month so far this year, compared with 709,537 butchered in September. It was however, slightly smaller than last year's October calf kill of 738,211 head. January-October slaughter of 6,166,402 calves lagged behind last year's 6,239,600 for the period.

Slaughter of 6,144,099 hogs, the new high for October, compared with 5,144,401 butchered in September and 5,177,810 a year ago. The year's aggregate number of hogs slaughtered through October was 47,188,892 head, or about 19 per cent larger than the 40,934,222 butchered in the same 1954 period.

Slaughter of sheep and lambs in October, with the bulk of the early fall replacement stock still below marketable flesh, declined to 1,247,536 head from 1,344,466 killed in September and numbered slightly less

than last year's October kill of 1,291,251 ovines. The earlier monthly gains in inspected slaughter of the animals over comparable 1954 periods resulted in a ten-month total of 12,067,055 as against 11,820,351 last year.

FEDERALLY INSPECTED SLAUGHTER

CATTLE			
	1955	1954	
January	1,521,087	1,541,041	
February	1,318,151	1,302,454	
March	1,324,490	1,511,008	
April	1,451,705	1,416,787	
May	1,557,973	1,439,143	
June	1,640,677	1,570,363	
July	1,524,475	1,622,038	
August	1,706,589	1,635,175	
September	1,751,619	1,637,606	
October	1,692,772	1,751,619	
November		1,601,839	
December		1,582,719	

CALVES			
	1955	1954	
January	563,408	546,050	
February	517,039	517,691	
March	659,555	600,485	
April	595,814	598,377	
May	587,528	501,146	
June	610,500	622,028	
July	649,644	639,933	
August	645,579	649,390	
September	709,537	706,283	
October	727,738	738,211	
November		694,264	
December		638,732	

HOGS			
	1955	1954	
January	5,518,987	4,712,157	
February	4,687,846	3,883,165	
March	5,491,165	4,853,795	
April	4,472,045	3,853,169	
May	4,164,338	3,380,365	
June	3,713,180	3,453,270	
July	3,428,043	3,325,097	
August	4,474,888	3,822,044	
September	5,144,401	4,743,350	
October	6,144,099	5,177,810	
November		5,840,532	
December		6,119,109	

SHEEP AND LAMBS			
	1955	1954	
January	1,223,337	1,242,776	
February	1,070,567	1,090,106	
March	1,244,190	1,148,930	
April	1,179,811	1,095,684	
May	1,228,444	1,044,814	
June	1,205,300	1,199,683	
July	1,075,724	1,209,450	
August	1,238,680	1,207,354	
September	1,344,466	1,290,008	
October	1,247,536	1,291,251	
November		1,160,437	
December		1,167,110	

TEN-MONTH TOTALS			
	1955	1954	
Cattle	15,776,538	15,291,800	
Calves	6,166,402	6,239,600	
Hogs	47,188,892	40,934,222	
Sheep	12,067,055	11,820,351	

SALABLE LIVESTOCK AT 12 MARKETS IN OCT.

	Oct., 1955	Oct., 1954
CATTLE		
Chicago	215,886	187,045
Cincinnati	28,771	24,730
Denver	117,757	100,516
Fort Worth	59,237	57,254
Indianapolis	29,281	45,232
Kansas City	141,378	110,684
Oklahoma City	68,820	69,332
Omaha	232,681	202,179
St. Joseph	70,677	61,149
St. Louis NSY	92,084	90,485
Sioux City	149,313	130,989
S. St. Paul	127,781	119,907
Totals	1,328,064	1,197,111

CALVES		
Chicago	11,322	15,814
Cincinnati	4,494	4,603
Denver	10,733	16,506
Fort Worth	18,079	20,965
Indianapolis	3,087	5,543
Kansas City	16,277	16,254
Oklahoma City	13,899	19,580
Omaha	23,466	34,658
St. Joseph	7,015	8,857
St. Louis NSY	21,407	24,338
Sioux City	23,645	24,506
S. St. Paul	61,871	56,410
Totals	215,918	249,438

HOGS		
Chicago	253,072	185,432
Cincinnati	69,640	68,987
Denver	12,046	12,322
Fort Worth	10,808	7,707
Indianapolis	178,214	218,880
Kansas City	44,392	42,658
Oklahoma City	14,538	11,596
Omaha	229,851	154,790
St. Joseph	129,794	99,880
St. Louis NSY	224,910	211,787
Sioux City	169,487	130,027
S. St. Paul	306,214	248,012
Totals	1,642,966	1,302,098

SHEEP		
Chicago	86,021	82,298
Cincinnati	7,751	8,520
Denver	158,022	169,115
Fort Worth	23,353	31,164
Indianapolis	14,346	21,190
Kansas City	30,846	27,893
Oklahoma City	5,011	7,064
Omaha	75,626	95,162
St. Joseph	23,059	24,787
St. Louis NSY	27,890	30,336
Sioux City	40,047	47,090
S. St. Paul	92,610	94,515
Totals	534,722	589,729



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SLAUGHTER REPORTS

Special reports to THE NATIONAL PROVISIONER, showing the number of livestock slaughtered at 13 centers for the week ended Nov. 19, 1955, compared:

CATTLE			
Week Ended	Prev. Week	Cor.	Week
Nov. 19	Nov. 19	1954	1954
Chicago† ...	27,175	24,983	26,747
Kan. City† ...	17,454	16,787	15,506
Omaha† ...	30,814	29,085	27,799
E. St. Louis† ...	10,186	9,909	10,043
St. Joseph† ...	10,662	8,699	
Sioux City† ...	12,231	11,139	7,452
Wichita† ...	5,425	4,981	7,426
New York & Jer. City† ...	10,603	12,285	
Okl. City† ...	10,003	10,021	
Cincinnati† ...	4,306	5,329	4,359
Denver† ...	15,870	12,747	13,092
St. Paul† ...	18,537	17,813	15,432
Milwaukee† ...	8,882	8,902	4,543
Totals ...	145,730	167,953	164,444
HOGS			
Chicago† ...	56,877	41,016	54,110
Kan. City† ...	16,221	13,962	12,362
Omaha† ...	94,668	98,030	75,409
E. St. Louis† ...	51,528	27,161	37,539
St. Joseph† ...	51,746	44,840	
Sioux City† ...	39,743	37,618	38,401
Wichita† ...	17,015	17,650	15,731
New York & Jer. City† ...	51,098	53,961	
Okl. City† ...	18,071	15,508	
Cincinnati† ...	16,735	12,850	14,456
Denver† ...	13,855	12,373	13,472
St. Paul† ...	86,963	80,573	77,757
Milwaukee† ...	9,000	7,910	5,184
Totals ...	403,295	470,067	458,829
SHEEP			
Chicago† ...	7,672	5,192	8,120
Kan. City† ...	3,401	4,690	5,768
Omaha† ...	9,161	10,399	12,026
E. St. Louis† ...	7,109	4,958	5,723
St. Joseph† ...	4,156	7,443	
Sioux City† ...	3,977	2,972	4,999
Wichita† ...	1,396	1,696	2,474
New York & Jer. City† ...	43,673	50,165	
Okl. City† ...	2,205	1,913	
Cincinnati† ...	527	988	660
Denver† ...	11,796	9,888	4,916
St. Paul† ...	12,782	10,253	7,556
Milwaukee† ...	1,328	1,622	1,509
Totals ...	60,059	107,201	113,272

*Cattle and calves.
†Federally inspected slaughter, including direct.
‡Stockyards sales for local slaughter.

CANADIAN KILL

Inspected slaughter in Canada for week ended November 12:

	Ended Nov. 12	Same week 1955	Same week 1954
CATTLE			
Western Canada...	19,158	17,349	
Eastern Canada...	20,044	18,686	
Totals	39,202	36,035	
HOGS			
Western Canada...	70,238	53,051	
Eastern Canada...	66,941	55,473	
Totals	137,179	108,524	
SHEEP			
Western Canada...	8,408	6,413	
Eastern Canada...	22,770	22,081	
Totals	31,178	28,494	

NEW YORK RECEIPTS

Receipts of salable livestock at Jersey City and 41st st., New York market for week ended Nov. 19:

Cattle Calves Hogs* Sheep			
Salable ...	163	42	...
Total (Inc. directs)...	6,300	2,485	26,304
Prev. week:			
Salable ...	164	36	...
Total (Inc. directs)...	4,061	3,164	20,896

*Including hogs at 31st St.

CHICAGO LIVESTOCK

Supplies of livestock at the Chicago Union Stockyards for current and comparative periods:

RECEIPTS			
	Cattle	Hogs	Sheep
Nov. 16... 17,599	320	13,735	2,478
Nov. 17... 2,130	335	28,624	4,185
Nov. 18... 965	448	14,857	1,057
Nov. 19... 85	139	1,582	...
Nov. 20... 22,000	300	14,000	2,500
Nov. 21... 10,000	500	26,500	4,700
*Total last week			
	32,000	800	40,500
Prv. wk. 30,779	800	45,298	8,226
Yr. ago... 26,265	1,029	40,813	7,083
2 yrs. ago... 28,499	1,155	32,375	8,259
SHIPMENTS			
Nov. 16... 7,431	52	3,503	1,452
Nov. 17... 4,555	22	9,371	1,907
Nov. 18... 2,819	14	5,505	1,529
Nov. 19... 292	...	2,427	191
Nov. 21... 7,000	...	2,000	500
Nov. 22... 5,000	...	12,000	1,000
*Including 200 cattle, 100 calves, 5,500 hogs and 700 sheep direct to packers.			

NOVEMBER RECEIPTS			
	1955	1954	
Cattle	157,561	155,864	
Calves	82,640	77,145	
Hogs	321,707	264,590	
Sheep	41,550	35,991	

NOVEMBER SHIPMENTS			
	1955	1954	
Cattle	82,640	67,144	
Hogs	110,345	85,168	
Sheep	14,640	7,572	

CHICAGO HOG PURCHASES

Supplies of hogs purchased at Chicago, week ended Tues., Nov. 22:

	Week ended Nov. 22	Week ended Nov. 16
Packers' purch....	47,308	46,089
Shippers' purch....	27,072	33,856
Totals	74,380	79,945

LIVESTOCK PRICES AT LOS ANGELES

Prices paid for livestock at Los Angeles on Wednesday, Nov. 23 were reported as shown in the table below:

CATTLE:			
Steers, prime	None qtd.		
Steers, gd. & ch... ..	\$19.50@20.00		
Steers, com'l	17.00@18.00		
Heifers, util. & com'l ..	14.00@16.00		
Cows, util. & com'l ..	10.25@13.00		
Cows, can. & cut... ..	8.00@10.00		
Bulls, cut. & util... ..	12.50@14.50		
CALVES:			
Good choice	\$17.00@18.50		
Com'l & good	16.00@17.00		
Cull & util.	10.00@15.00		
HOGS:			
U.S. 1-3, 165/220... ..	None qtd.		
U.S. 1-3, 220 lbs... ..	13.50 bid		
U.S. 1-3, 260 lbs... ..	12.50 only		
Sows, 200/490	\$11.00@12.90		

LIVESTOCK RECEIPTS

Receipts at 20 markets for the week ended Friday, Nov. 18, with comparisons:

	Cattle	Hogs	Sheep
Week to date	342,000	760,000	158,000
Previous week	350,000	670,000	157,000
Same wk. 1954	328,000	625,000	141,000
1955 to date	13,662,000	20,150,000	8,054,000
1954 to date	14,120,000	17,474,000	7,755,000

PACIFIC COAST LIVESTOCK

Receipts at leading Pacific Coast markets, week ended Nov. 17:

	Cattle	Hogs	Sheep
Los Ang. ...	10,450	1,100	800
N. P. land... ..	3,175	400	2,350
San Fran... ..	800	150	950

LIVESTOCK PRICES AT LEADING MARKETS

Livestock prices at five western markets on Monday, November 21 were reported by the Agricultural Marketing Service, Livestock Division, as follows:

	St. L. N.B. Yds.	Chicago	Kansas City	Omaha	St. Paul
HOGS (Including Bulk of Sales):					
BARROWS & GILTS:					
U.S. No. 1-3:					
120-140	lbs.. None qtd.	None qtd.	None qtd.	None qtd.	None qtd.
140-160	lbs.. \$12.25-12.50	None qtd.	None qtd.	None qtd.	None qtd.
160-180	lbs.. 12.50-12.75	\$11.00-12.50	None qtd.	\$11.25-12.00	None qtd.
180-200	lbs.. 12.50-13.00	12.00-12.75	\$11.50-12.15	11.00-12.00	\$10.75-12.25
200-220	lbs.. 12.00-13.00	11.75-12.75	11.50-12.15	11.00-12.00	10.75-12.00
220-240	lbs.. 11.75-12.50	11.40-12.50	11.50-12.15	11.00-12.00	10.75-12.00
240-270	lbs.. 11.25-12.25	11.00-11.60	11.50-11.75	10.75-11.75	10.50-11.00
270-300	lbs.. 10.75-11.50	11.00-11.35	None qtd.	10.50-11.25	10.50-11.00
300-330	lbs.. None qtd.	None qtd.	None qtd.	None qtd.	10.00-10.75
330-360	lbs.. None qtd.	None qtd.	None qtd.	None qtd.	None qtd.
Medium:					
160-220	lbs.. None qtd.	None qtd.	None qtd.	8.75-11.25	None qtd.
SOWS:					
Choice:					
270-300	lbs.. 10.25-10.50	11.00 only	10.25-10.50	10.00-10.50	10.00-10.25
300-330	lbs.. 10.25-10.50	11.00 only	10.25-10.50	10.00-10.50	10.00-10.25
330-360	lbs.. 10.25-10.50	11.00 only	10.25-10.50	10.00-10.50	9.75-10.00
360-400	lbs.. 10.00-10.50	10.50-11.00	10.25-10.50	10.00-10.50	9.75-10.00
400-450	lbs.. 10.00-10.25	10.50-10.75	10.00-10.25	10.00-10.50	9.25- 9.75
450-550	lbs.. 9.75-10.25	10.00-10.50	9.50-10.00	9.50-10.00	8.50- 9.25
Medium:					
250-500	lbs.. None qtd.	None qtd.	None qtd.	None qtd.	None qtd.
SLAUGHTER CATTLE & CALVES:					
STEERS:					
Prime:					
700- 900	lbs.. 22.50-23.75	None qtd.	None qtd.	None qtd.	None qtd.
900-1100	lbs.. 22.75-23.75	22.00-23.75	21.25-22.50	21.75-22.75	21.00-22.00
1100-1300	lbs.. 21.25-23.75	20.75-24.00	19.50-22.00	20.50-22.00	21.00-22.00
1300-1500	lbs.. 20.25-22.75	19.50-22.75	18.50-20.50	18.25-21.50	20.00-21.00
Choice:					
700- 900	lbs.. 19.00-22.75	20.00-22.25	19.00-21.25	18.75-21.75	20.00-21.00
900-1100	lbs.. 19.00-22.75	19.50-22.25	18.50-21.25	18.50-21.75	19.50-21.00
1100-1300	lbs.. 18.50-21.25	18.75-22.00	17.25-21.00	17.00-21.25	19.00-20.50
1300-1500	lbs.. 18.00-20.25	17.75-20.75	16.50-19.50	16.00-20.50	18.00-19.50
Good:					
700- 900	lbs.. 17.75-19.25	17.75-20.00	16.50-19.00	16.00-20.00	17.50-19.00
900-1100	lbs.. 17.25-19.25	16.75-20.00	16.00-19.00	16.00-20.00	17.00-19.00
1100-1300	lbs.. 16.00-18.50	16.25-19.50	16.00-19.00	15.50-19.00	16.50-18.50
Commercial,					
all wts. .	14.50-17.75	13.50-17.75	13.00-17.00	12.00-15.00	13.50-16.00
Utility,					
all wts. .	12.00-14.50	12.00-13.50	12.00-13.00	10.50-12.00	11.00-13.00
HEIFERS:					
Prime:					
600- 800	lbs.. 21.75-23.00	None qtd.	20.50-22.00	None qtd.	20.00-21.00
800-1000	lbs.. 21.75-23.00	21.00-22.00	20.00-22.00	21.00-22.50	20.00-21.00
Choice:					
600- 800	lbs.. 19.00-21.75	19.50-21.00	19.00-20.00	19.00-20.50	19.00-20.00
800-1000	lbs.. 19.00-21.75	19.00-21.00	19.00-20.00	18.50-20.50	19.00-20.00
Good:					
500- 700	lbs.. 16.75-19.25	17.00-19.50	16.50-19.00	16.00-19.00	17.50-19.00
700- 900	lbs.. 16.75-19.25	17.00-19.50	16.50-19.00	16.00-19.00	17.50-19.00
Commercial,					
all wts. .	13.50-16.75	12.50-17.00	12.00-15.00	None qtd.	13.00-15.50
Utility,					
all wts. .	10.50-13.50	10.00-12.50	10.00-12.00	None qtd.	11.00-13.00
COWS:					
Commercial,					
all wts. .	11.00-12.00	10.50-12.00	10.25-12.00	11.00-12.00	11.00-12.00
Utility,					
all wts. .	9.50-11.00	9.25-11.00	9.00-10.25	9.00-10.50	9.00-11.00
Can. & cut.,					
all wts. .	6.50- 9.50	7.75-10.00	7.50- 9.50	7.50- 9.00	7.00- 9.00
BULLS (Yrln. Excl.) All Weights:					
Good	10.50-11.00	10.50-13.00	None qtd.	11.00-12.00	11.50-12.50
Commercial	12.50-13.50	14.00-14.50	None qtd.	12.00-13.00	11.50-12.50
Utility	11.00-12.50	12.75-14.00	None qtd.	11.00-12.00	12.00-13.50
Cutter	9.50-11.50	11.75-12.75	None qtd.	10.00-11.00	12.00-13.50
VEALERS, All Weights:					
Ch. & pr....	20.00-27.00	21.00-23.00	None qtd.	18.00-20.00	19.00-21.00
Com'l & gd..	15.00-20.00	18.00-21.00	None qtd.	13.00-18.00	14.00-19.00
CALVES (500 Lbs. Down):					
Ch. & pr....	16.00-18.00	15.00-18.00	None qtd.	16.00-18.00	16.00-18.00
Com'l & gd..	12.00-16.00	12.00-15.00	None qtd.	11.00-16.00	13.00-16.00
SHEEP & LAMBS:					
LAMBS (110 Lbs. Down):					
Ch. & pr....	18.75-19.25	18.75-20.00	18.00-19.00	18.25-18.75	19.00-19.50
Gd. & ch....	17.50-18.75	18.00-19.00	17.00-18.00	17.50-18.25	18.50-19.00
LAMBS (105 Lbs. Down) (Shorn):					
Ch. & pr....	18.50-19.00	18.50-19.50	18.50-19.00	18.00-18.75	18.50-19.00
Gd. & ch....	17.00-18.50	17.50-18.75	16.50-18.00	17.00-18.00	17.50-18.50
EWES:					
Gd. & ch....	4.00- 5.00	5.25- 6.50	4.50- 5.00	3.00- 4.50	4.50- 5.50
Cull & util..	2.50- 4.00	4.00- 5.25	3.00- 4.50	2.00- 3.00	2.50- 4.50
NOTE: Hog prices declined sharply on Tuesday. Cattle and sheep quotations at Kansas City and Omaha as of November 22.					

PACKERS' PURCHASES

Purchases of livestock by packers at principal centers for the week ended Saturday, November 10, 1955, as reported to The National Provisioner:

CHICAGO

Armour, 20,063 hogs; Shippers, 35,871 hogs; and Others, 30,814 hogs.

Totals: 27,175 cattle, 954 calves, 92,748 hogs, and 7,612 sheep.

KANSAS CITY

Armour, 3,044 857 4,026 1,861
Swift, 3,161 856 5,899 1,887
Wilson, 1,083 4,500 998
Butchers, 6,765 798
Others, 1,083 798

Totals: 15,741 1,713 16,221 3,401

OMAHA

Armour, 8,075 21,163 2,677
Cudahy, 4,126 17,803 1,581
Swift, 6,187 20,022 2,376
Wilson, 3,982 16,175 1,211
Am. Stores, 1,045
Cornhusker, 1,274
O'Neill, 778
Neb. Beef, 820
Eagle, 83
Gr. Omaha, 878
Hoffman, 69
Rothschild, 1,405
Roth, 1,219
Kingman, 1,033
Merchants, 63
Midwest, 185
Omaha, 775
Union, 731
Others, 17,995

Totals: 32,788 93,158 7,848

E. ST. LOUIS

Armour, 3,133 741 14,524 3,750
Cudahy, 3,573 1,882 22,001 3,530
Hunter, 857 9,063
Heli, 2,510
Krey, 3,440
Laclede,
Luer

Totals: 7,563 2,623 51,528 7,109

SIoux CITY

Armour, 3,987 17 23,257 2,528
S. C. Dr.,
Beef, 3,200
Swift, 4,650 14,212 5,117
Butchers, 717
Others, 10,832 187 37,782 1,420

Totals: 23,386 209 75,251 9,065

WICHITA

Cudahy, 1,938 483 1,734
Kansas, 875
Dunn, 135
Dold, 164 636
Sunflower, 83
Excel, 965
Armour, 109 701
Swift, 717 665
Others, 1,311 473 275

Totals: 5,580 483 2,843 1,071

LOS ANGELES

Armour, 263
Cudahy, 74
Swift, 508
Wilson, 500
Com'l, 1,287
Atlas, 1,228
United, 674 3 382
Ideal, 673
Gr. West, 490
Salter, 463
Acme, 436
Harman, 315
Clougherty, 114
Luer, 71
Rosen, 83 230
Sur Vail, 377
Others, 2,821 259 71

Totals: 10,201 492 638

ST. PAUL

Armour, 6,445 5,329 35,474 6,116
Bartusch, 1,215
Rifkin, 1,107 27
Superior, 2,162
Swift, 7,768 5,561 51,489 6,866
Others, 1,927 5,163 20,392 1,010

Totals: 20,464 15,890 107,355 13,792

FORT WORTH

Armour, 1,477 1,872 799 2,233
Swift, 1,839 1,364 951 2,070
Bl. Bon't, 261
City, 524 1 128
Rosenthal, 65

Totals: 4,126 3,228 1,858 4,305

DENVER

Armour, 2,170 79 3,242
Swift, 1,735 108 3,595 2,100
Cudahy, 886 55 6,057 153
Wilson, 703 6 2,012
Others, 6,279 78 3,192 328

Totals: 11,753 326 12,844 8,035

MILWAUKEE

Armour, 872 7,004 8,804 1,077
Butchers, 2,807 1,690 286 291

Totals: 3,699 8,754 9,090 1,328

TOTAL PACKER PURCHASES

Week end Prev. week
Nov. 19 week 1954
Cattle, 163,476 180,393 162,766
Hogs, 463,534 325,127 412,949
Sheep, 64,226 63,535 67,051

CORN BELT DIRECT TRADING

Des Moines, Nov. 22 - Prices at the ten concentration yards and 11 packing plants in Iowa and Minnesota were quoted by the USDA as follows:

Hogs, U.S. No. 1-3:

120-150 lbs. \$ 7.75@10.25
150-200 lbs. 9.75@11.35
240-300 lbs. 8.90@11.20
300-400 lbs. 8.65@10.25

Sows:

270-360 lbs. 9.10@10.40
400-550 lbs. 7.10@ 9.00

Corn Belt hog receipts were reported as follows by the U. S. Department of Agriculture:

	This week	Last week	Last year
Nov. 17	80,000	89,000	68,000
Nov. 18	79,000	30,000	58,000
Nov. 19	53,000	53,000	45,000
Nov. 21	115,000	96,000	87,000
Nov. 22	80,000	93,000	61,000

BALTIMORE LIVESTOCK

Livestock prices at Baltimore, Md., on Tuesday, Nov. 22 were as follows:

Steers, gd. & ch., \$21.25 only
Heifers, ch. & pr., None qtd.
Cows, util. & com'l, 11.00@12.50
Cows, can. & cut., 7.00@10.00
Bulls, util. & com'l, 13.50@15.25
Bulls, cutter, 12.50@13.50

VEALERS:

Choice & prime \$29.00@30.00
Good & choice 23.00@28.00
Com'l & good 16.00@23.00

HOGS:

U.S. 1-3, 170/200, \$12.75@13.00
U.S. 1-3, 200/235, 12.75@13.00
U.S. 1-3, 230/270, 12.50@12.75
Sows, 400/down 11.00 only

LAMBS:

Choice 21.00 only

LIVESTOCK CARLOADINGS

A total of 14,598 railroad cars was loaded with livestock in the week ended November 5, the Association of American Railroads, has reported. This was an increase of 563 cars over loadings the corresponding week of 1954 and 68 cars more than the same period two years earlier.

MEAT ANIMAL PRICES BY YEARS

Market price per 100 lbs. for selected classes of meat animals, by years 1949-54, by months 1955, as reported by the U. S. Department of Agriculture.

Period	Beef steers for slaughter, Chicago			Cows, Chicago ¹			Lambs Single, Chgo. Choice & Prime		
	Choice	Util.	All grades	Commercial	Canner	Cutter	Barrows, gilts, all wts.	Chgo. Choice	Chgo. Choice
1949	\$26.07	\$19.77	\$25.80	\$18.41	\$13.95	\$18.02	\$25.45		
1950	29.68	22.86	29.35	21.48	16.48	18.39	27.30		
1951	35.96	28.31	35.72	27.76	20.58	20.74	34.29		
1952	38.18	22.70	32.38	21.74	16.82	18.28	27.40		
1953	24.14	15.77	23.62	13.92	10.67	22.03	22.96		
1954	24.60	15.27	24.23	13.28	9.60	22.18	22.08		
1955									
Jan.	26.98	14.95	28.12	12.38	9.20	16.75	21.21		
Feb.	26.17	15.07	24.46	13.50	10.28	16.10	22.06		
Mar.	25.80	15.40	24.12	13.96	10.74	16.11	23.24		
Apr.	24.62	15.71	23.36	14.70	11.08	16.90	22.12		
May	23.09	15.10	22.18	14.02	10.73	17.24	21.96		
June	22.63	14.64	22.15	14.08	10.91	19.51	24.14		
July	22.72	15.59	22.52	13.23	10.68	17.83	22.07		
Aug.	22.43	14.26	22.33	12.53	9.80	16.31	21.79		
Sept.	22.69	14.55	22.67	12.26	9.41	16.18	21.11		
Oct.	22.01	14.22	21.95	12.58	9.61	14.44	20.58		

¹Data prior to 1951 are approximate equivalent of present grades.

²Average for all weights and grades.

³Shorn. ⁴Spring.

Compiled from MARKET NEWS, Livestock Division.

LIVESTOCK PRICES AT 11 CANADIAN MARKETS

Average price per cwt., paid for specific grades of steers, calves, hogs and lambs at 11 leading markets in Canada during the week ended November 12, compared with the same time 1954, was reported to the National Provisioner by the Canadian Department of Agriculture as follows:

STOCK-YARDS	GOOD STEERS Up to 1000 lbs.		VEAL CALVES Good and Choice		HOGS* Grade B ¹ Dressed		LAMBS Good Handyweight	
	1955	1954	1955	1954	1955	1954	1955	1954
Toronto	\$19.50	\$19.75	\$24.00	\$23.00	\$22.50	\$25.13	\$19.50	\$19.50
Montreal	18.50	18.50	22.05	21.35	22.50	25.50	19.00	19.55
Winnipeg	18.50	17.50	19.79	18.00	20.08	22.29	17.25	16.75
Calgary	18.57	18.92	16.84	14.10	19.25	22.30	15.78	16.74
Edmonton	18.50	18.50	16.50	16.50	19.80	22.50	15.75	16.75
Lethbridge	18.20	19.25	16.00	16.00	18.00	22.12	15.86	16.75
Tr. Albert	17.10	17.00	17.00	17.00	18.50	20.50	14.75	15.75
Moose Jaw	17.75	18.25	16.40	14.50	18.50	20.75	14.25	16.75
Saskatoon	17.25	18.25	19.00	19.00	18.50	21.15	15.90	17.25
Regina	17.50	16.65	17.75	15.90	18.50	21.00	14.25	14.90
Vancouver	18.60	16.95	17.50	17.00	22.65	22.65	18.25	

*Dominion Government premiums not included.

SOUTHERN RECEIPTS

Receipts of livestock at six southern packing plant stockyards located in Albany, Moultrie, Thomasville, and Tifton, Georgia; Dothan, Alabama and Jacksonville, Florida during the week ended Nov. 18:

	Cattle	Calves	Hogs
Week ended Nov. 18	4,477	1,573	17,501
Week previous (five days)	3,228	1,246	12,902
Corresponding week last year	3,974	1,410	10,681

LIVESTOCK PRICES AT SIOUX CITY

Prices paid for livestock at Sioux City on Tuesday, Nov. 22 were reported as follows:

CATTLE:
Steers, prime \$20.75@22.50
Steers, choice 18.25@19.75
Steers, good 15.50@18.50
Steers, com'l 14.00@16.50
Heifers, choice 16.00@20.00
Heifers, good 15.50@18.25
Cows, util. & com'l, 8.50@11.50
Cows, can. & cut., 7.00@ 8.50
Bulls, com'l & gd., 9.50@11.50
Bulls, cut. & util., 11.00@13.00

HOGS:

U.S. 1-3, 180/200, \$10.50@11.00
U.S. 1-3, 200/220, 10.50@11.00
U.S. 1-3, 220/240, 10.50@11.00
U.S. 1-3, 240/270, 9.75@11.00
Sows, 270/360 lbs., 9.50@ 9.75

LAMBS:

Good & prime 17.50@18.75

CANADIAN KILL

Inspected slaughter of livestock in Canada in Oct., 1955-54 compared, as reported by the Dominion Department of Agriculture:

	Oct. 1955	Oct. 1954
Cattle	142,520	135,751
Calves	57,898	57,359
Hogs	458,513	398,846
Sheep	91,676	97,429

Average dressed weights of livestock slaughtered in the two months were:

	Oct. 1955	Oct. 1954
Cattle	457.5 lbs.	479.3 lbs.
Calves	144.6 lbs.	145.4 lbs.
Hogs	161.8 lbs.	161.5 lbs.
Sheep	43.9 lbs.	42.1 lbs.

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HELP YOU NEED WITH**

PROVISIONER "APPROVED" BOOKS

The books listed below are selected from a number of sources. In the opinion of the editors of the National Provisioner they are factual, practical and worthwhile — and are approved and recommended accordingly.

Use them to:

- Save time and money
- Increase profits
- Improve efficiency
- Improve knowledge
- Help plan future activities
- Be informed on modern methods
- Earn more
- Learn more
- Do a better job

OPERATING

O-1 MEAT SLAUGHTERING AND PROCESSING \$5.00. Information helpful to small slaughterer or locker plant operator interested in killing and meat processing. Discusses: fundamentals; plant location, construction; beef slaughter, by-products; hog slaughter, inedible rendering; casing processing; lard rendering; track installations; curing; smoking; sausage manufacture.

O-2 SAUSAGE AND READY-TO-SERVE MEATS \$4.50. Covers manufacture of sausage and specialties including meat loaves, cooked and baked hams, canned meats; technical problems of spoilage prevention.*

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MANAGEMENT

M-6 MEAT PACKING PLANT SUPERINTENDENCY \$4.50. General summary of plant operations not covered in Institute books on specific subjects. Discusses plant locations, construction, maintenance, power plant, refrigeration, insurance, operation controls, personnel controls, incentive plans, time keeping, safety.*

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S-9 MICROBIOLOGY OF MEATS \$6.00. New third edition. Microbiology of meat foods by the chief bacteriologist, Swift & Company. In addition to revised chapters on cured and comminuted meats, green discolorations, microbiology of beef and bacon, bacteriology of pork and other subjects, chapters have been added on cured meats, effects of cure on bacteria, bacterial spores, canned meats, storage of canned and packaged meats, etc.

S-10 FEEDS AND FEEDING \$7.00. 21st edition. Standard comprehensive reference book on livestock feeding and nutrition by expert Frank B. Morrison. Presents detailed information on nutrition, feeding, care of farm animals, including poultry. Composition, use, nutritive value of all important livestock feeds; emphasis on recent discoveries in animal nutrition and livestock feeding.

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